# AMERICAN RAILROAD JOURNAL.

## STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

**HENRY V. POOR, Editor.**

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**American Railroad Journal.**

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**Saturday, March 22, 1851.**


### Indiana.

*New Albany and Salem Railroad.*—The company to construct this road was organised in the year 1847. During that and the following year the Legislature of the State granted to the company the right to extend the road to any place in the State the company might select. After this it was resolved to extend the road through Salem, (to which point it has been finished and is in operation,) Bedford, Bloomington, Gosport, Crawfordsville, to Lafayette and Michigan City, at the south end of Lake Michigan, and thence to Chicago with a branch from Gosport to Indianapolis. The length of the road, from New Albany, its starting point, to Chicago, will be 315 miles; and 360 miles, including the branch from Gosport to Indianapolis. It crosses the Cincinnati and St. Louis road some 67 miles from New Albany, and will connect, by the branch to Indianapolis, with the Bellefontaine road, leading east through Ohio. About 130 miles from New Albany it crosses the Terre Haute road, and at Lafayette, the Wabash and Erie Canal. It will connect with the Michigan Central and Michigan Southern railroads, at Michigan City, and with the Upper Mississippi, through the Chicago and Galena roads. As yet books have only been opened for taking the stock to construct the road to Gosport, a distance of 112 71-100 miles. The second division of the work, between Salem and the east fork of White river, about 31 miles in length, will probably be completed by the first of next October. The third divisicn from the east fork of White river to Gosport, 47 miles, was let in December, 1849; but not progressing as fast as was desired, it is intended by the directors, unless the work goes on more rapidly, to take it out of the hands of the present contractors and relet it, in order, if possible, to have it completed by next year.

As much of the road as is completed is laid with a heavy flat bar 2½ by ½. With the exception of ten miles, intended to be laid as above, the remainder will be laid with a T rail of about 60 pounds to the yard. The cost of the entire road from New Albany to Gosport, 112 71-100 miles, is estimated at $1,136,975 40. The expense of equipments, such as locomotives, cars, depots, etc., is estimated at $215,544 60; which would make the total cost of the road, ready for business, $1,352,520; or, $12,000 per mile. The estimated net receipts for the carriage of freight, passengers and mails, etc., after deducting 59 per cent for expenses, are $172,-125; or, 12.72 per cent on the cost of road and equipments. As to "ways and means," $760,000 can be put down as the amount of subscriptions, and what is taken by contractors; to which may be added $500,000 to be raised by sale of bonds at par. This will leave $92,520 to be raised by further subscription. To secure the payment of the $500,000, it is proposed to mortgage the entire line to that amount. Upwards of $400,000 of the subscriptions ($760,000) have been paid in. After the first of July, 1853, it is proposed to reserve 20 per cent of the net earnings of the road as a sinking fund for the payment of the bonds, which will be issued, payable from the first day of April, 1851, at an average of ten years. Not more than $100,-000, however, will fall due in any one year. That amount will fall due annually, from 1859 to 1863, inclusive; and as concerns security under the mortgage, all the bonds will be upon a par.

### Innianapolis and Bellefontaine Railroad.

The organization of the company to construct this road took place on the 3d of July, 1848. The length of the road is about 83 miles. It starts from Indianapolis and runs to the Ohio line, north east of Winchester, in Randolph county, where it connects with the Bellefontaine and Indiana road. It is expected to be completed and in running order, as far as Muncie, by next fall, and, by the fall of the following year, to Union, at the State-line. At the latter time, in all probability, the entire lines from Pittsburgh, Cleveland and Sandusky, thro' Bellefontaine and Sidney, from Wheeling thro' Columbus, Urbana and Piqua, and from Cincinnati through Dayton and Greenville, will be completed to the eastern terminus of this road. It connects, at Indianapolis, with the Madison line, and intersects the Jeffersonville, New Albany, Lawrenceburgh, Evansville, Terre Haute, Lafayette, Richmond and Peru roads. Its maximum grade is 30 feet to the mile, with 76 miles of straight line.—It has no curves of a less radius than 5730 feet. In the construction of the work, the T rail of 60 lbs. is used. It will cost about $10,000 per mile. The work, pursuant to provisions of charter, is divided into three divisions of about equal length. The first extends from Indianapolis to Pendleton, the second from the latter place to Muncie, and the third from Muncie to Union. The first twenty-eight miles have been completed, at a cost of $9,359 per mile, inclusive of some equipments, but not of motive power. Of the second section, about eight miles will be laid with iron when the ground will permit in the spring. Eighteen miles more will be ready for the iron by the first of June, and will be finished and in readiness for business by next fall. The clearing and grubbing of the third division is nearly completed, and about one-third of the grading is in progress. On this road, the depot buildings are situated on "turnouts," leaving the main track free. Since the 11th of last December a daily train has been run on the first section, and the receipts to the first of the present month, inclusive of the sums received from irregular trips made since the 10th of October, amount to $3,830 91.—The charges for running during that time were $1,645 38, leaving a balance of proceeds of $2,185 53; or, about 5½ per cent on the cost of the section.

Since the last report, the number of subscribers to the stock of the company has increased 467. Of the subscriptions $57,454 are payable in land, $27,-

022 in cash, and $5,825 in labor and materials, making a total of $90,301. The land subscriptions now amount to $232,454, the cash subscriptions to $206,149, and the labor and material subscriptions to $41,550, being a total of $480,153. The whole number of subscribers is 2,648. Excluding the expense of iron, chairs and spikes, the cost of the whole road, 83 miles, is estimated at $3,382 per mile, making an aggregate cost of $280,706, leaving a surplus of $199,447 applicable to superstructure. The amount received into the treasury, exclusive of lands, is $174,241 52. The expenditures have been $170,674 39; leaving a balance of $3,567 13.

The officers of the company for the present year are:—

DIRECTORS.

O. H. Smith, Marion County.
Alfred Harrison, "
Thomas R. Noel, Hancock and Hamilton Cos.
William Sparks, Madison Co.
Allen Makepeace, "
Madison G. Walker, "
David Kilgore, Delaware Co.
Samuel P. Anthony, "
James Truitt, "
Jeremiah Smith, Randolph Co.
William M. Way, "
David Heaston, "
Joseph McClellan, Johnson Co.
William A. Rifner, Henry Co.
R. H. Winslow, New York City.

President,
O. H. SMITH.
Secretary,
JAMES G. JORDAN.
Treasurer,
AUSTIN W. MORRIS.
Engineer,
THOMAS A. MORRIS,
Assistant Engineer,
ROBERT M. PATTERSON.

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*From Appleton's Mechanics' Magazine.*

## The Application of Iron to Railway Structures.

Continued from page 148.

*Longitudinal Compression and extension of Cast and Wrought Iron.*—The commissioners made many experiments "for the purpose of supplying data for completing the mechanical theory of elastic beams. If a beam be in any manner bent, its concave side will be compressed, and its convex side extended, and an exact knowledge of the laws which govern its compression and extension must precede any accurate general theory of its deflections, vibrations, and ruptures." The law usually assumed—viz., that the longitudinal compressions and extensions are, within certain limits, proportional to the forces by which they are produced, "although very nearly true in some bodies, is not, perhaps, accurately true for any material. Experiments have therefore been made to determine with precision the direct longitudinal extension and compression of long bars of cast and wrought iron.—The extensions were determined by attaching a bar 50 feet in length and 1 inch square, to the roof of a lofty building, and suspending weights to its lower extremity. The compressions were ascertained by inclosing a bar 10 feet long and 1 inch square in a groove, placed in a cast iron frame, which allowed the bar to slide freely without friction, and yet permitted no lateral flexure. The bar was then compressed by means of a lever loaded with various weights. Every possible precaution was taken to insure accuracy. The following formulæ were then deduced for expressing the relation between the extension and compression of a bar of cast iron 10 feet long and 1 inch square, and the weights producing them respectively:—

Extension, $w = 116{,}117\,e - 201{,}905\,e^2$
Compression, $w = 107{,}763\,d - 36{,}318\,d^2$

where $w$ is the weight in pounds acting upon the bar, $e$ the extension, and $d$ the compression in inches. And the formulæ deduced from these, for a bar one inch square, and of any length, are—

For extension,

$$w = 12{,}903{,}040\,\frac{e}{l} - 2{,}907{,}432{,}000\,\frac{e^2}{l^2}$$

For compression,

$$w = 12{,}931{,}570\,\frac{d}{l} - 522{,}089{,}200\,\frac{d^2}{l^2}$$

where $l$ is the length of the bar in inches. These formulæ were obtained from the mean results of four kinds of cast iron. The mere tensile strength of cast iron, derived from these experiments, is 15,711 pounds per square inch, and the ultimate extension 1·600 of its length, and this weight would compress a bar of iron of the same section 1·775 of its length. It must be observed that the usual law is very nearly true for wrought iron."

"Experiments have also been made upon the transverse strength and resistance of bars of wrought and cast iron, acted upon by horizontal as well as vertical forces. These experiments will be found to exhibit very fully the deflections and sets of cast iron, and the defect of its elasticity. The bars which were experimented upon by transverse pressure were of sections varying from one inch square to three inches square, and of various other sections, and the actual breaking weights show that the strength of a bar one inch square should not be taken as the unit for calculating the strength of a larger casting of similar metal, although the practice of doing so has been a prevalent one; for it appears that the crystals in the portion of the bar which cools first are small and close, whilst the central portion of bars two inches square, and three inches square, is composed of comparatively large crystals, and bars of three inches square in section, planed down on all sides alike to three quarters of an inch square, are found to be very weak to resist both transverse and crushing pressure. Hence it appears desirable, in seeking for a unit for the strength of iron of which a large casting is to be made, that the bar used should equal in thickness the thickest part of the proposed casting."

In the remaining portion of the report, the commissioners refer to the information they have collected respecting the qualities of various kinds of cast iron, and the respective properties of the hot blast and cold blast iron. They mention, with approval, a recommendation—

"That engineers, in contracting for a number of girders, should stipulate that they should not break with less than a certain weight (leaving the mixture to the founder) and cause one more than the required number to be cast. The engineer may then select one to be broken, and if it break with less weight than that agreed upon, the whole may be rejected."

A general description of the several kinds of iron bridges for railways follows, and the commissioners report, in conclusion, that—

"Considering the attention of engineers has been sufficiently awakened to the necessity of providing a superabundant strength in railway structures, and also considering the great importance of leaving the genius of scientific men unfettered for the development of a subject as yet so novel and so rapidly progressive as the construction of railways, we are of opinion that any legislative enactments with respect to the forms and proportions of the iron structures employed therein would be highly inexpedient.

"We would, however, direct attention to the general conclusions we have arrived at from our own experiments, and from the information supplied to us, namely:—

"That it appears advisable for engineers, in contracting for castings, to stipulate for iron to bear a certain weight, instead of endeavoring to procure a specified mixture.

"That to calculate the strength of a particular iron for large castings, the bars used as a unit should be equal in thickness to the thickest part of the proposed casting.

"That, as it has been shown that to resist the effects of reiterated flexure iron should scarcely be allowed to suffer a deflection equal to one-third of its ultimate deflection, and since the deflection produced by a given load is increased by the effects of percussion, it is advisable that the greatest load in railway bridges should in no case exceed one-sixth of the weight which would break the beam when laid at rest *in the centre.*

"That, as it has appeared that the effect of velocity communicated to a load is to increase the deflection that it would produce if set at rest upon the bridge; also that the dynamical increase in bridges of less than 40 feet in length is of sufficient importance to demand attention, and may, even for lengths of 20 feet, become more than one-half of the statical deflection at high velocities, but can be diminished by increasing the stiffness of the bridge—it is advisable that, for short bridges especially, the increased deflection should be calculated from the greatest load and highest velocity to which the bridge may be liable; and that a weight which would statically produce the same deflection should, in estimating the strength of the structure, be considered as the greatest load to which the bridge is subject. For the method of calculating this increased deflection, we beg to refer to appendix B.

"Lastly, the power of a beam to resist impact varies with the mass of the beam, the striking body being the same; and by inertia of the beam without adding to its strength, the power to resist impact is, within certain limits, also increased.—Hence it follows that weight is an important consideration in structures exposed to concussions.

"Whilst, however, we lament that the limited means which have been placed at our disposal, and the great time required for such investigation, have compelled us to leave in an imperfect state, and even to neglect altogether, many interesting and important branches of experimental inquiry, we trust that the facts and opinions which we have been enabled to collect will serve to illustrate the action which takes place under varying circumstances in iron railway bridges, and enable the engineer and mechanic to apply the metal with more confidence than heretofore."

*Tensile Strength of Cast Iron from various parts of the United Kingdom.*—Seventeen kinds of iron used. Specific gravity ranging from 6·906 to 7·181. Form of transverse section of specimens, cruciform. Breaking weight per square inch of section, from 5·602 tons to 7·949 tons, except the Clyde iron No. 3, of which the breaking weight per square inch of section reached 10·477 tons.—Mr. Morries Sterling's iron, hot blast, mixed and melted with about 20 per cent of *malleable iron scrap*, had a breaking weight of 11·502 tons per square inch of section. Another quality, composed of hot blast, Staffordshire iron, mixed and melted with about 15 per cent of common *malleable iron scrap*, had a breaking weight of 10·474 tons.

*Tensile Strength of Cast Iron of Different Forms of Section.*—Forms of section used—*cruciform*, extreme breadth four inches and depth three inches; uniform thickness of arms 64 inches; *rectangular*, 2·3 inches × 1·75 inches; and *circular*, 2·26 inches diameter: the intended area in all the forms being equal to four square inches. Mean breaking weight per square inch of the *cruciform* section varied from 6·253 tons to 6·784 tons; of the *rectangular*, from 6·115 tons; and of the *circular* from 6·614 tons to 6·983 tons. From these results it may be inferred that *little or no difference in the tensile strength of cast iron arises essentially from the form of its section.*

*Strength of Cast Iron in Various Sectional Forms to Resist Crushing.*—The first set of experiments were upon *cylinders*, the specimens being in two proportions—viz., having diameter of section equal to height, and having a height equal to double the diameter of section. In the first cases, the mean crushing weight per square inch of section varied from 27·512 tons to 28·810 tons. In the second cases, it varied from 24·988 tons to 29·779 tons.—The second set of experiments were upon *triangular prisms*, of which the bases were intended to be

equilateral triangles, with sides one inch in length; with a height of specimen of one inch, the mean crushing weight per square inch of section was 29·905 tons, and with a height equal to two inches it was 31·045 tons. The third set of experiments were upon *rectangular prisms*. The base of each prism was intended to be one square inch, with a height of one inch, the mean crushing weight per square inch of section was 28·112 tons, and with a height of two inches, 26·437 tons.

*Comparative Power to Resist Crushing of Cast Iron from Different Parts of the Kingdom.*—The specimens were cylinders three-quarters of an inch in diameter, and three-quarters of an inch and one inch and a half in height. The general mean crushing weight per square inch of section varied from 27·004 tons to 40·109 tons. Mr. Stirling's irons required crushing weights of 54·640 tons and 64·403 tons respectively, the third quality showing the greater resistance.

*Ratio of Tensile to Crushing Resistance in Cast Iron.*—The torn specimens being of a cruciform section, and those crushed of a circular section and cylindrical form. The resistances being reduced to those due to a square inch of section, the ratio is seen to vary from 1 : 4·518 to 1 : 6·735. The average ratio of the whole (omitting Mr. Stirling's as being a compound iron) is 1 : 5·6603.

To be continued.

### Royal Scottish Society of Arts.

*Chimney of the Edinburgh Gas Works.*

The present session was opened on the 11th November, by a valuable address from Mr. Grainger, the president; after which, Mr. Buchanan read an elaborate paper on "The Chimney of the Edinburgh Gas Works." The length of the paper renders it impossible for us to find room for it at present, but we shall return to it next month, giving, meanwhile, a subsidiary paper by M. Taylor, Esq., the engineer of the works, being a "detailed description of the works."

In this paper, Mr. Taylor gave a minute detail of the dimensions and structure of every part of the work. The foundation was on hard shale or clay; the masonry 40 feet 6 inches square at the bottom, 12 feet below the surface of the ground; 32 feet 6 inches at the surface of the ground; and brought up by steps in hard foundation courses of Craigleith stone, dressed and square-jointed. Mason work of the most substantial description, with four eyes for connecting the main flues to the stalk. Square pedestal 65 feet high from surface of ground to top of base of brick shaft; 30 feet 10 inches square at base course; 30 feet square above base, and 27 feet 9 inches under moulding of top. Body of pedestal of neatly-covered ruble work of the strongest kind, the stone chiefly from Hailes Quarry of the best rock. The cope mouldings and base of brick; shaft of Craigleith. Within the pedestal, and rising 20 feet above it, is an inner chimney or brick shaft standing quite detached, having a space from 18 inches to 2 feet clear in every part; but this space covered over at the top to keep out soot deposit, but yet left free of the outer pedestal and chimney. The inner chimney is 90 feet high, 13 feet diameter inside, carried up at four different thicknesses, beginning at 3½ bricks thick, and ending at 2 bricks, including a lining of fire brick, carried up the whole way at two thicknesses —20 feet at 10 inches thick, and 70 feet at 5 inches. The brickwork of the best well burnt circular stock brick, with a course of headers in reeled order for every four courses of stretchers. The main brick shaft is 264 feet high above the stone pedestal;—making, with the pedestal, 65 feet, and foundation 12 feet 6 inches—in all 341 feet 6 inches. The shaft is 26 feet 3 inches diameter at bottom externally, tapers to 13 feet 10 inches at the height of 243 feet, at the first belt under coping 11 feet 10 in. below the top. The shaft is carried up at five different thicknesses, beginning at 35 inches, or 3½ bricks, for 35 feet up, and ending with 15 inches, or 1½ brick, for 58 feet at the top, all built with hard circular composition brick, referred to in the experiments on the strength of bricks. Brickwork put together in the strongest manner with headers, as already described, and best band all laid in the best lime from Burdiehouse, with sharp sand, sifted and made up in the mill. The beds are kept as thin as possible, and neatly pointed in with the edge of the trowel. All the vertical joints inside of wall, grouted up with thin lime. As a farther security, the shaft is bound with six malleable iron hoops, at intervals of 35 feet up, built into the brick work, one brick on bed from the outside, and kept ¼ inch clear all round off the outside lining of brick work, so as to allow the hoops to expand with heat without injury to the work. They are all 3 inches broad; the under three 1 inch thick, the upper ¾ inch each, made in three lengths, clamped together and made fast with 3 ¾in. or ⅞in. rivets on each side. The projecting cope at the top is of cast iron, 19 feet 6 inches diameter over all, and in sixteen pieces about ¾ inch thick, screwed together with bolts through the flanges. The cope being all fitted and bound together in a mass on the top of the stalk, the brick work was continued up, and finished with a cope or plate of cast iron, composed of eight pieces of ¾-inch thick, and about 2¼ feet broad, with a round belt going 9 inches down on the brick work, and forming a strong hoop round it. The chimney is furnished with an endless chain going up the inside of the main shaft, giving the means of ascending at any time to the top. The ellectric conductor stands 6 feet above the top-plate, ¾-inch round copper made fast to stone and brick work, with 7¾-inch copper holdfasts let 4 inches into the masonry or brick work, with a head on the inside and an eye on the outside to receive the rod as it was carried up. By these holdfasts an ascent can easily be made to the top by a small tackle suspended to the holdfasts. The conductor is metallically connected to all the iron work on the stalk—the plate on the top, projecting cope, malleable iron hoops, bolts on the top of stone pedestal, and also the ascending chain. The rod descends into a well about 10 feet from the foundation, and is immersed about 8 feet deep in water, and the end turned up 2 feet in a horizontal direction and flattened.—*Prac. Mechanics' Journal.*

### English Railways.

*Progress of Railway Traffic.*

We copy from the British Almanac the following in relation to the progress of railroad traffic in England, which possesses much interest for railroad companies in this country:—

It is one of the features of the railway system, consequent on the enlargements which have marked that system, that the average receipts per mile per week have gradually lessened. So long as the lines open were *main* lines, terminating at both ends in important towns, they were fed by lateral traffic which tended to swell the receipts; but when branch lines were made, they could not bring other than mere branch traffic; and when competing lines were made, they diverted some of the traffic which originally belonged to the main lines.

The length of railway open for passenger traffic on July 1, 1849, in the United Kingdom, was 5,447 miles; and on December 31 in the same year it amounted to 6,032 miles. In the first half of that year they were carried 28,767,867 passengers; and in the second half, 35,073,672; making a total of 63,841,539 in the year. The receipts for carrying these passengers amounted to £1,927,767 for 1st class, £2,530,968 for 2d class, and £1,819,156 for 3d class, giving a total of £6,277,931; or an average of about 2s. each passenger. In 1848 (see *Companion* for 1850, p. 67) the average payment per passenger per journey was 2s. 1d., showing a remarkably near approximation in two successive years. The goods traffic during 1849 amounted to £5,528,606, making, with the passenger traffic, a fraction under one million sterling per calender month.

In the half-year ending June 30, 1850, the traffic for goods and passengers realized £6,130,200; of which the expenses absorbed £2,861,240; leaving for profit the sum of $3,268,960 to pay interest on debentures, and divided on shares. The total sum expended down to the above date was about £220,000,000 on about 6,000 miles of railway then opened, and on many hundred (perhaps as many as two thousand) miles in various stages of progress.—The average expenditure on all the railroads in the United Kingdom considerably exceeds £30,000 per mile.

When the time shall arrive for making up the railway accounts for the whole of the year 1850, it will probably be found that the number of passengers has largely increased, but that the average rate of payment has lessened, owing to the vast numbers who have travelled at very low fares by the excursion trains. The average receipts per mile per week have gradually lessened, but it is probable that the immense holiday traffic of the autumn of 1850 may prevent the average of the whole year from falling below that (per mile) of 1849. Instead of comparing the whole year (which we cannot yet do for 1850) we may take the first 39 weeks of each year, from January 1 to September 30; and we find the following results:—

| Years. (Jan. 1 to Sept. 30.) | Receipts. | Miles open. | Per mile per week. |
|---|---|---|---|
| 1844.... .... | £4,215,440 | 1770 | £64 |
| 1845.... .... | 4,960,320 | 2033 | 67 |
| 1846.... .... | 5,758,600 | 2498 | 64 |
| 1847.... .... | 6,685,880 | 3375 | 56 |
| 1848.... .... | 7,500,680 | 4178 | 50 |
| 1849.... .... | 8,275,679 | 4983 | 45 |
| 1850.... .... | 9,525,707 | 6075 | 44 |

As the number of miles open refers to the date of Sept. 30 in each year, and as in the early part of each year the number is, of course, less, the real average per mile per week is somewhat higher than that given above, though it cannot be stated accurately.

The holiday or excursion traffic just alluded to, is worthy of a little attention. There has been for many years a great difference of opinion among leading authorities in the railway world, whether high fares, moderate fares, or low fares, will bring the grater amount of net profit to the companies; or, in other words, to what extent will lowering the fares tend to increase the number of travellers. It is admitted on all hands that *very high* fares would not bring the greatest aggregate net profit; but it is also admitted, that nothing but experience will determine what degree of cheapness is the most profitable. The probability of an immense influx of visitors to London in 1851 renders the decision of this question an object of much importance; and the excursion trains of 1850 afford interesting information bearing on this point. These trains have met with a success never before equalled; the fares have been lower than were ever before ventured; and yet the directors of the various companies seem well satisfied with the result. The Brighton railway company was perhaps the first to commence the system. Until 1850 the third class excursion trains from London to Brighton and back were usually charged 5s. per ticket; but in this year the charge has been reduced to 3s. 6d. The South eastern company followed, and made their 6s. tickets available not only to Dover but to Margate and Ramsgate; while their Reading branch was made available to a 3s. 6d. ticket.—The South Western then astonished railway travellers by their 3s. tickets to Southampton and back, and equally cheap tickets elsewhere. The Great Western company, who have hitherto hung back from excursion trains, next entered the field and placed Windsor, Oxford, Bath, Bristol, and Chelterham, within the limits of excursions. Late in the season the Eastern Counties company followed in the same track; while the northern companies have not been slow to develope the system. The ingenuity which the companies have exhibited in finding out new objects for pleasure excursions, shows that the results are deemed satisfactory; that the abstraction from ordinary traffic is not equal to the addition by holiday traffic.

### The Wheeling Bridge Case.

Chancellor Walworth's report to the Supreme Court, on the Wheeling bridge case, is, in substance, as follows:—

"I have arrived at the conclusion, and do accordingly decide and report, that the Wheeling suspension bridge is an obstruction to the free navigation of the Ohio river, by the vessels propelled by steam, which are now engaged in the commerce and navigation of that river, and by such vessels as will undoubtedly be engaged in the navigation and commerce of that river hereafter. And I further decide and report that the change or alteration which can or should be made in the construction of the existing conditions of the bridge, to remove

the obstruction which now exists to the free navigation of the river by steamboats, is to raise the suspension cables and the flooring of the bridge, in such a manner as to give a level headway of at least 300 feet, inside, over a convenient part of the channel, and not less than 128 feet above the level of zero, on the Wheeling water guage.

"This elevation is 28 feet above the highest point of the present bridge, and 60 feet above the elevation of the bridge at the western abutment.—It will give 80 feet headway on the usual high floods of the Ohio, and its estimated cost is $208,600."

### Hot Air Engine.

A paper has been read to the Institution of Civil Engineers, descriptive of Sir G. Cayley's hot air engine, by Mr. W. W. Poingdestre. After entering briefly into the theoretical considerations of the expansion of heated aeriform bodies, and detailing the attempts made by Lieut. Ericcson for employing hot air, instead of steam, as a prime mover, the author proceeded to state, that in 1837 Sir G. Cayley applied the products of combustion from close furnaces so that they should act at once upon a piston, in a cylinder, similar in every respect to that of a single acting steam engine. The engine consisted of a generator of heat, a working cylinder, and an air pump or blower—the air pump being half the size of the cylinder, and blowing air into and through a fire perfectly inclosed within the generator. The doors of the furnace were made perfectly air tight as soon as the fire was well got up; the first impulse being given to the engine by throwing a few jets of water upon the fire, which caused the air pump to work immediately, and continued so for hours, the fire being replenished by stopping off the blast from the furnace, and opening the upper bonnet. After the air had passed through the fire, the gaseous products of combustion, generally at a temperature of 600° Fahrenheit, passed laterally through a chamber, used for separating them from any ashes or cinders, into the working cylinder before alluded to. The difficulty attending this description of engine was, the liability of the working parts to be deranged by the great sensible heat destroying the valves, pistons, and cylinders, and carbonizing the lubricating oil. It was stated, that Mr. A. Gordon had made a successful experiment on the application of the heated products of combustion for propelling a boat, without the intervention of any machinery between the furnace and the water to be acted on.

### Britannia Bridge.

We give below from an English publication, a description, the most complete which we have seen, of this great work, the wonder of modern engineering.

First, then, for the Britannia tower. The Britannia rock is formed of Chlorite schist, a very hard stone, difficult of working; and as the rock is dry only for a few hours at a time, the labor and difficulty of forming the foundation of the stupendous tower were very great. The tower is built of hard carboniferous limestone, obtained from the Penmon quarries on Anglesea island; the stones were quarried with iron wedges, and worked into form with heavy steel picks; some of the stones are 20 feet in length, and others weigh from 12 to 14 tons. The stones are all left with a rough or quarry face, except at the angles, the recesses and the entablature. A great portion of the interior masonry of the tower is formed of Cheshire red sandstone. The total height of the tower from the foundation is 230 feet, nearly 30 feet higher than the monument on Fish street hill, and 200 feet above high water. Its width and depth at the base are 62 feet by 52; but at the height where the tubes rest on, or rather enter the tower, these dimensions diminish to 55 by 45. The tower contains 148,625 cubic feet of limestone, and 144,625 of sandstone, weighing together nearly 20,000 tons; while 387 tons of cast iron are built into it in the form of beams and girders.

The east and west, or Caernarvonshire and Anglesea towers, are similar in general construction to the vast Britannia tower, but somewhat smaller; they stand at a clear distance of 460 feet from the Britannia tower. Each tower measures 62 feet by 52 at the base, tapering to 55 feet by 32 at the level of the bottom of the tubes. The height is 190 feet above high water. There are 210 tons of cast iron beams and girders worked into each tower.

The east and west, or Caernarvonshire and Anglesea abutments, are situated inland, at a distance of 230 feet from the east and west towers respectively, and are constructed of massive masonry.—They are ornamented by colossal figures of lions, in the Egyptian couchant style; these lions are each composed of 11 pieces of limestone; they are 25 feet long, 12 feet high, and weigh about 30 tons each. They were sculptured by Mr. Thomas, who is employed on the stone carving for the new houses of parliament. It was part of the gigantic plan to have a colossal figure of Britannia, 60 feet high, on the central tower; but this has not yet been executed, and the company have no funds to bestow upon it.

But the tubes are the most remarkable feature in the bridge. Each portion of tube, between two adjacent towers, is in fact a hollow girder, strong enough to bear its own weight, and to bear a laden railway train in addition; and it was a necessary condition of its construction, that it should be either constructed in its ultimate position on a suspended scaffolding, or else lifted *entire* into its place, after having been put together elsewhere.—Each tube is a girder, too, in this respect—that it derives no strength from any transmission of horizontal pressure to the abutments, such as is derived by the arch; nor from any mode of suspension, such as in a chain bridge; but it resists incumbent pressure in the same way as any rigid plank, beam or girder. These girders or tubes are quadrangular in section; they are hollow from end to end; and their roofs and floors are each formed of a row of smaller square tubes; for it has been found that greater strength is attained by this arrangement, than by forming the same weight of metal into a solid sheet or plate. Each line of tube, the up and the down, is upwards of a quarter of a mile in length; the ends rest in the abutments, and the intermediate portions rest on the three towers, or rather pass through square openings in them. Although they thus form two continuous tubes, they consist in fact of eight pieces, four to each tube, which are joined end to end at the piers. The height of the tubes is 30 feet at the Britannia tower, and diminishes to about 23 feet at the abutments; the upper surface being slightly arched, but the lower horizontal. The clear internal height varies from about 19 feet to 26. The external width is nearly 15 feet, and the internal about 14. The sides, top and bottom are all formed of wrought iron plates, varying from 6 to 12 feet in length, from 21 to 28 inches in width, and from ⅜ths to ⅞ths of an inch in thickness. The plates, (some of which weigh nearly 7 cwts. each) are laid lengthwise in the top and bottom, but vertically in the sides of the tube. The largest plates are in the bottom, where they are arranged in a double layer. The plates are joined together by rivets; and are stiffened and strengthened at the joints by T shaped iron, both inside and out, which form vertical bars up the sides, at distances of two feet apart. The connection of the top and bottom with the sides is made more substantial by triangular "gusset pieces," rivetted in at the corners. The rivets in the entire structure are almost incredibly numerous; they are placed four inches apart in the top and bottom, and three inches apart in the sides. They are rather more than an inch in diameter, and were driven red hot into the rivet holes, which holes were made by a powerful machine that punched out forty holes in a minute. The whole bridge contains nearly two millions of these rivets. The square cells, tubes, or flues, which form the top and bottom, are 14 in number, viz: 8 in the top, measuring 21 inches high by 21 wide; and 6 in the bottom, 21 inches high by 28 wide. The vertical sides of these cells are strongly connected to the plates of the top and bottom with L shaped bars of wrought iron. The two tubes contain 65 miles in length of T and L iron. The whole weight of wrought iron in the tubes is about 3200 tons.

The mode of constructing these tubes was not the least remarkable part of the operations. The short tubes (those between the abutments and the side towers) were constructed on platforms at their ultimate level; but the long tubes (those between the side towers and the Britannia tower) were constructed on floating platforms on the Caernarvonshire beach. The scaffolding for building the towers and the short tubes was among the finest ever yet formed. It consisted of whole "balks" of timber, logs from 12 to 16 inches square, and some of them as much as 60 feet long; they were fastened together without nails, so as to be afterwards available without injury for other purposes. This beautifully formed scaffolding beneath the short tubes was about 100 feet in height; and around the Britannia tower it rose to a height of 250 feet. The span between the abutments and the side towers is 230 feet; but the short tubes are each 242 feet long, to allow space for resting on their supports. In like manner the span between the Britannia tower and the side towers is 460 feet; but the long tubes are 472 feet, to furnish supports at the ends.

The long tubes, it has been stated, were constructed on the Caernarvonshire beach. The platforms for this purpose were made of whole balks of timber, and extended nearly half a mile along the beach; each of the four long tubes having a platform to itself. When the tubes were finished, their transport from the platforms to the towers was, like all else in the enterprise, cleverly managed. Each tube was conveyed on eight huge pontoons, or close barges; each pontoon being capable of floating a weight of 400 tons. These pontoons were brought beneath the ends of the tube; and by taking advantage of variation of tide, they lifted the tube off the platform, and supported its whole weight. They were then navigated, by enormous hawsers, cables, and capstans, to the Britannia rock, where the tube was brought as nearly as could be to it proper position. All the four long tubes were, one by one, as fast as they were finished, floated in a similar way to the Britannia tower, and placed across the river at the proper spot, where arrangements were made for supporting them until they were raised into their place.

The lifting of these tubes is regarded, we believe, as the most gigantic operation of the kind of which the history of engineering has any record. Each one of the four large tubes, with the apparatus attached to it for aiding the lift, weighed 1800 tons; and this unparalleled weight had to be raised to a height of about 100 feet! It was effected through the medium of hydraulic pressure. Chains of enormous strength were fastened to the ends of the tubes; and the upper ends of these chains were connected with hydraulic presses constructed on the tops of the towers; these presses, like many other parts of the apparatus, were larger and more powerful than any before constructed for any purpose. Two steam engines, of 40 horse power each worked the presses; ths presses gradually drew up the chains; and the chains carried up the tube; and so extraordinary was the precision of the arrangements, that a long day of about eighteen hours was sufficient to raise a tube to its full height.

*From the Year Book of Facts.*

### Application of Electro-Magnetism as a Motive Power.

BY MR. ROBERT HUNT.

In this paper (read to the Society of Arts, London,) the author called attention, in the first place, to the numerous attempts which have been made to apply electro-magnetism as a power for moving machines, and particularly described the apparatus employed by Jacobi, Dal Negro, M'Gauley, Wheatstone and others, noticing incidentally the machines recently constructed by Mr. Hjorth. Since, notwithstanding the talent which has been devoted to this interesting subject, and the large amount of money which has been spent in the construction of machines, the public are not in possession of any electro-magnetic machine which is capable of exerting any power economically; and finding that, notwithstanding the aid given to Jacobi by the Russian government, that able experimentalist has abandoned his experimental trials—the author has been induced to devote much attention to the examination of the first principles by which the power is regulated, with the hope of being able to set the entire question on a satisfactory basis.

The phenomenon of electro-magnetic induction was explained, and illustrations given of the magnetisation of soft iron by means of a voltaic cur-

rent made to circle around it. The power of electro-magnets was given, and the author stated his belief that this power could be increased without limitation.

A voltaic current produced by the chemical disturbance of the elements of any battery, no matter what its form may be, is capable of producing by induction a magnetic force, *this magnetic force being always in an exact ratio to the amount of matter (zinc, iron, or otherwise) consumed in the battery.*

Several forms of the voltaic battery were explained, particularly those of Daniell, Grove, Bunsen, and Reinsch; the latter being constructed without metals, depending entirely on the action between two dissimilar fluids, slowly combining.

The author had, however, proved, by an extensive series of experiments, that the greatest amount of magnetic power is produced when the chemical action is the most rapid. Hence, in all magnetic machines, it is more economical to employ a battery under an intense action, than one in which the chemical action is slow. It has has been proved by Mr. Joule, and most satisfactorily confirmed by the author, that one horse power is obtainable in an electro magnetic engine, the most favorably constructed to prevent loss of power, at the cost of 45 pounds of zinc, in a Grove's battery, in 24 hours; while 75 pounds are consumed in the same time to produce the same power in a battery of Daniell's construction. The cause of this was referred to the necessity of producing a high degree of excitement to overcome the resistance which the molecular forces offer to the electrical perturbations, on which the magnetic force depends.

It was contended that, although we have not perhaps arrived at the best form of voltaic battery, yet that we have learned sufficient ot the law of electro magnetic forces to declare that, under any conditions, the amount of magnetic power would depend on the change of state—consumption of an element—in the battery, and that the question resolved itself into this:

What amount of magnetic power can be obtained from an equivalent of any material consumed?

The following were regarded as the most satisfactory results yet obtained:

1. The force of voltaic current being equal to 678, the number of grains of zinc destroyed per hour was 151, which raised 9000 pounds one foot high in that time.

2. The force of current being, relatively, 1300, the zinc destroyed in an hour was 291 grains, which raised 10,030 pounds through the space of one foot.

3. The force being 1000, the zinc consumed was 223 grains; the weight lifted one foot 12,672 lbs.

The estimations made by Messrs. Scoresby and Joule, and the results obtained by Oersted, and more recently by Mr. Hunt, very nearly agree; and it was stated that one grain of coal consumed in the furnace of a Cornish engine lifted 143 pounds one foot high, whereas one grain of zinc consumed in the battery lifted only 80 pounds. The cost of one hundredweight of coal is under 9 pence, and the cost of one hundredweight of zinc is above 216 pence. Therefore, under the most perfect conditions, magnetic power must be nearly 25 times more expensive than steam power.

But the author proceeded to show that it was almost proved to be an utter impossibility ever to reach even this condition, owing, in the first place, to the rate with which the force diminishes through space. As the mean of a great many experiments on a large variety of magnets, of different forms and modes of construction, the following result was given:—

| | | | |
|---|---|---|---|
| Magnet and armature in contact lifting force | | 220 | pounds. |
| " | distant 1-250 of an inch | 90.6 | " |
| " | " 1-125 " | 50.7 | " |
| " | " 1-63 " | 50.1 | " |
| " | " 1-50 " | 40.5 | " |

Thus, at one-fiftieth of an inch distance, four-fifths of the power are lost.

This great reduction of power takes place when the magnets are stationary.

The author then proceeded to show that the moment they were set in motion a great reduction of the original power took place; that, indeed, any disturbance produced near the poles of a magnet, diminished, during the continuance of the motion, its attractive force.

The attractive force of a magnet being 150 pounds when free of disturbance, fell to one-half, by occasioning the armature to revolve near its poles.

Therefore, when a system of magnets, which had been constructed to produce a given power is set in revolution, every magnet at once suffers an immense loss of power, and consequently their combined action falls into practice very far short of their estimated power. This fact has not been before distinctly stated, although the author is informed that Jacobi observed it.

And not merely does each magnet thus sustain an actual loss of power, but the power thus lost is converted into a new form of force, or rather becomes a current of electricity, acting in opposition to the primary current by which the magnatism is induced.

From an examination of all these results, Mr. Hunt is disposed to regard electro-magnetic power as impracticable on account of its cost, which must necessarily be, he conceives, under the best conditions, 50 times more expensive than steam power.

The Chairman (Mr. W. F. Cooke) agreed with Mr. Hunt in his conclusion of the improbability of any result being obtained from electro-magnetism which could enable it to eompete with steam as a motive power. At any rate, the point to which the attention of engineers and experimentalists should be turned at present was, not the contriving of perfect machines for applying electro-magnetic power, but the discovery of the most effectual means of disengaging the power itself from the conditions in which it existed stored up in nature. Mr. Farraday assured us that in a single drop of water is contained as much electricity as is developed in a thunderstorm. The portion of this which we can liberate by any existing battery is very small; so small that, as shown by Mr. Hunt's paper, its practical use cannot be profitable. The study of electro-chemistry, he thought, was a more promising field, and one from which might at a future time be developed a power which should supercede even steam.

### Banks in the United States.

The February number of the Bankers' Magazine, has the following statement respecting the banks of the several States, and their aggregate capital at the close of the year 1850:—

| States | No. of Banks. | Capital. |
|---|---|---|
| Maine | 35 | $3,548,000 |
| New Hampshire | 22 | 2,205,000 |
| Vermont | 27 | 2,225,000 |
| Massachusetts | 130 | 38,260,005 |
| Rhode Island | 63 | 11,179,872 |
| Connecticut | 42 | 10,073,101 |
| New York | 195 | 48,976,868 |
| Delaware | 9 | 1,440,000 |
| Louisiana | 5 | 16,600,000 |
| New Jersey | 26 | 3,754,900 |
| Pennsylvania | 53 | 16,609,781 |
| Georgia | 17 | 5,329,215 |
| Maryland | 24 | 9,072,873 |
| Virginia | 35 | 9,713,100 |
| North Carolina | 19 | 3,650,000 |
| South Carolina | 14 | 11,431,183 |
| District of Columbia | 4 | 1,182,300 |
| Mississippi | 1 | 100,000 |
| Ohio | 57 | 7,427,171 |
| Kentucky | 26 | 10,180,000 |
| Alabama | 2 | 2,000,000 |
| Indiana | 13 | 2,082,910 |
| Tennessee | 21 | 8,165,197 |
| Missouri | 6 | 1,208,751 |
| Wisconsin | 1 | 225,000 |
| Iowa | 1 | 200,000 |
| Texas | 1 | 300,000 |
| Michigan | 6 | 762,000 |
| | 855 | $226,902,222 |

From this table, it appears that we have in the Union eight hundred and fifty-five banks, the aggregate capital of which is two hundred and twenty-six millions, nine hundred and two thousand, two hundred and twenty-two dollars, and that Massachusetts possesses nearly one-sixth part of the banking capital of the United States, and yet we learn from the Boston papers that applications for an increase of banking capital there are more numerous and more urgent than in any other State in the Union, though the population does not amount to one-twentieth part of that of the country. Massachusetts has more than three-fourths as much banking capital as the State of New York, and more than double that of the State of Pennsylvania.

### A Flue of Flues.

In course of operations in the Tamar Silver Lead Mines, on the borders of Devon and Cornwall, it became latterly essential either to erect a powerful steam engine at the foot of a subterranean inclined plane, 2000 feet in length, and running right below the river which runs right over the mine, to a perpendicular depth of 800 feet below its bed; or, failing that, to shut up the mine and throw 1500 people out of employment. It was, therefore, determined to adopt the former alternative, and a 20-horse steam engine, one of the patent combined hydraulic engines from Walker's manufactory at Oliver's yard, City-road, was accordingly fitted up at that depth. Flues were, of course, requisite, and it was found advisable to conduct these across to the furthest bank of the river, and in a series of horizontal levels united by perpendicular shafts, so that the flue in sections rises like a flight of stairs to the surface. The flue is no less than two miles long and upwards, probably the longest flue in the world. The result was quite successful, as will appear from the following statement:—"We drew through Spurgin's shaft in October month 2988 kibbles of stuff with Walker's new underground engine; this machine is well constructed, and I have every reason to believe she will pump the shaft 150 fathoms deeper than it is at the present time. We have in these mines six steam engines at work at the surface, but the draft of the underground engine exceeds the whole. The consumption of coals is 5 cwt. in the twenty-four hours.—*London Builder.*

### Pennsylvania.

*Reading Railroad.*—The following is the estimated income of this road for the coming year by the friends of this company:

| | | |
|---|---|---|
| Tolls on 1,500,000 tons of coal, at 1 50. | | $2,225,000 |
| Passengers and freight, same as Dec. and Jan.... | | 390,000 |
| U. S. Mail | | 9,400 |
| Miscellaneous receipts same as last year | | 8,600 |
| Total | | $2,633,000 |
| EXPENSES. | | |
| On coal, 62½ cts per ton | $931,650 | |
| On passengers | 65,000 | |
| On merchandize | 75,000 | |
| Missing coal and sundries | 55,000 | |
| Dumpage, &c. 6½ cts. per ton. | 97,500 | —1,224,150 |
| Net profits for the year | | $1,408,850 |
| Interest on bonds | $613,266 | |
| Renewal fund | 81,734 | — 695,000 |
| Dividend fund | | 713,850 |
| Interest on $1,600,000 preferred. | | 112,656 |
| Sinking fund | | 100,000 |
| State tax on dividends | 5,600 | 217,656 |
| Balance of dividend fund | | $496,194 |
| Dividend on common stock, $4,159,832 at 7 per cent | | $291,188 24 |
| | | 205,005 76 |
| Deduct State Tax, 5 per cent | | 10,250 00 |
| Surplus | | $194,755 76 |

The net receipts of the road in December, January and February were $270,000. The stock on the 1st of March, present, was thus divided:

| | | |
|---|---|---|
| Whole number of shares | | 83,196 |
| Held permanently in England | 21,000 | |
| " " Philadelphia | 8,100 | |
| " by brokers in Philadelphia. | 17,900 | |
| " " Boston | 3,700 | |
| " " New York | 14,510 | |
| " permanently in New York | 8,000 | |
| " " Boston | 9,986 | |
| | | 83,196 |

STATEMENT OF THE SEVERAL ITEMS OF EXPENDITURE OF TRANSPORTATION PER PASSENGER AND PER TON PER MILE ON THE HUDSON RIVER RAILROAD.

| | Amount. | Allotted to passenger transportat'n | Allotted to freight transportat'n | Per passenger per mile. | Passengers per mile run. | Freight per ton per mile. | Freight per mile run. |
|---|---|---|---|---|---|---|---|
| | | | | cts. | cts. | cts. | cts. |
| *Expenses of Maintaining Road.* | | | | | | | |
| Repairs of road bed and railway, excepting cost of iron, (see Law)..... | $14,338 55 | 13,826 55 | 512 00 | 0·077 | 8·726 | 0·223 | 0·080 |
| Depreciation of way..... | | | | | | | |
| Cost of iron used in repairs:— | | | | | | | |
| Allotted to passenger transportation, length in feet, weight in lbs. | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| " freight " " " | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Repairs of buildings..... | 53 62 | 53 62 | ..... | 0·0003 | 0·034 | ..... | ..... |
| Repairs of fences and gates..... | 4 02 | 4 02 | ..... | 0·00002 | 0·002 | ..... | ..... |
| Taxes on real estate..... | 4,269 11 | 3,794 11 | 475 00 | 0·021 | 2·395 | 0·207 | 1·694 |
| Totals ..... | 18,665 30 | 17,678 30 | 987 00 | 0·09832 | 11·157 | 0·430 | 1·914 |
| *Expenses of Repairs of Machinery.* | | | | | | | |
| Repairs of engines and tenders..... | 7,848 43 | 7,568 13 | 280 30 | 0·042 | 4 713 | 0·122 | 1·117 |
| Depreciation of do..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Repairs of passenger and baggage cars..... | 7,920 49 | 7,920 49 | ..... | 0·044 | 5·000 | ..... | ..... |
| Depreciation of do..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Repairs of freight cars..... | 405 90 | ..... | 405 90 | ..... | ..... | 0·177 | 1·618 |
| Depreciation of do..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Repairs of tools and machinery in shops..... | 482 67 | 465 43 | 17 24 | 0·003 | 0·294 | 0·007 | 0·068 |
| Incidental expenses, including oil, fuel, clerks, watchmen, etc, about shops. | 193 17 | 186 07 | 7 10 | 0·001 | 0·117 | 0·003 | 0·028 |
| Totals ..... | 16,850 66 | 16,140 12 | 710 54 | 0·090 | 10·124 | 0·309 | 2·831 |
| *Expenses of Operating the Road.* | | | | | | | |
| Office expenses, stationery, etc..... | 1,901 08 | 1,742 58 | 158 50 | 0·009 | 1·099 | 0·069 | 0·632 |
| Agents and clerks..... | 7,138 04 | 6,328 04 | 810 00 | 0·035 | 3·994 | 0·352 | 3·230 |
| Labor, loading and unloading freight..... | 840 92 | ..... | 840 92 | ..... | ..... | 0·366 | 3·353 |
| Porter, watchmen and switch tenders..... | 31,610 29 | 29,597 29 | 2,013 00 | 0·166 | 18·681 | 0·876 | 8·026 |
| Wood and water station attendance..... | 985 52 | 950 32 | 35 20 | 0·005 | 0·600 | 0·015 | 0·140 |
| Conductors, baggage and brakemen..... | 9,213 66 | 8,473 66 | 740 00 | 0·047 | 5·348 | 0·322 | 2·950 |
| Enginemen and firemen..... | 7,648 93 | 7,375 76 | 273 17 | 0·041 | 4·655 | 0·119 | 1·089 |
| Fuel, cost and labor preparing..... | 24,380 34 | 23,309 59 | 1,070 75 | 0·131 | 14·712 | 0·466 | 4·269 |
| Oil and waste for engines and tenders..... | 3,982 40 | 3,739 90 | 242 50 | 0·021 | 2·361 | 0·106 | 0·967 |
| " freight cars..... | 274 06 | ..... | 274 06 | ..... | ..... | 0 119 | 1·092 |
| " passenger and baggage cars..... | 2,306 55 | 2,306 55 | ..... | 0·013 | 1·456 | ..... | ..... |
| Loss and damage of goods and baggage..... | 381 76 | 287 06 | 94 70 | 0·001 | 0·181 | 0·041 | 0·380 |
| Damages for injuries to persons..... | 200 25 | 200 25 | ..... | 0·001 | 0·126 | ..... | ..... |
| " to property, including damages by fire and cattle killed on road.. | 305 26 | 305 26 | ..... | 0 002 | 0·192 | ..... | ..... |
| General superintendence..... | 3,498 70 | 3,373 10 | 125 60 | 0·019 | 2·129 | 0·054 | 0·500 |
| Contingencies..... | 23,699 75 | 22,839 75 | 860 00 | 0·128 | 14·416 | 0·374 | 3·430 |
| Totals..... | 118.829 11 | 110,829 11 | 7,538 40 | 0·619 | 69·950 | 3·279 | 30·058 |

## Ohio.

*Toledo, Cleveland, and Norwalk Railroad.*—There was a meeting of the stockholders of the Cleveland, Norwalk and Toledo railroad company, at Norwalk, at which a report was made, from which it appeared that according to the report of the engineer, the whole distance from Toledo by that route, to its junction with the Cleveland and Columbus railroad is 76 miles, and that for the completion of the substructure, ready for the iron, it will require at least.....$350,000

Of this sum there is subscribed,

| | | |
|---|---|---|
| in Huron county, including Bellevue..... | $90,000 | |
| Sandusky county..... | 20,000 | |
| Toledo ..... | 50,000 | |
| | 180,000 | |
| Add to this 20 per cent expected to be subscribed by contractors | 36,000 | |
| | | 216,000 |
| Leaving to be provided for..... | | 134,000 |
| To make up this deficiency they call upon the townships interested to vote, to raise by taxation the following amounts: | | |
| In Sandusky county..... | $50,000 | |
| In Huron county..... | 50,000 | |
| In Harris township Ottawa county | 1,500 | |
| In Clay " " " | 1,500 | |
| In Camden " Lorain " | 2,000 | |
| In Russia " " " | 10,000 | |
| Expected individual subscription | 14,000 | |
| | | 129,000 |
| Unprovided for in any way..... | | 5,000 |

The amendments to the law provide for taking the votes relative to taxation as follows:—All the townships in Sandusky county, except Townsend and Woodville, Clay and Harris in Ottawa; the five northern townships in Huron, and Camden and Russia in Lorain; and they recommend that the question be submitted to the people in the respective townships at the April election.

The directors were, by resolution, instructed to locate the road on the best and most feasible route from Fremont to Bellevue; and from thence by the best route to the northern townships of Huron county to Oberlin; and in making the location to consult the convenience and business accommodation of the public along the line, not incompatible with the interests of the company.—*Sandusky Clarion.*

*The Columbus, Piqua and Indiana Railroad.*—The President and one or two of the directors of this road have been in this city for several days, calling public attention to the importance of this enterprise.

Upon an examination of this road and its connections, shown us by these gentlemen, we confess that we have been more favorably impressed with its importance to our city than we ever were before.

This road may very properly be denominated a link, and a very important one too, in a chain of railway commencing from East to West through our State. Its general course from this city is North of West, in the direction of Urbana, a distance of 44 miles, where it crosses, at right angles, the Mad River and Lake Erie railroad, from thence to Piqua in the same direction; at this point it crosses the Miami Canal, and thence to the west line of the State, forming a connection with the Indianapolis and Bellefontaine railroad. No one can fail to see, by reference to the map of the State, that the line is nearly straight, and must necessarily throw a very large amount of travel into this city, and on our roads running East and North East from this point.

We are gratified to learn from these gentlemen, that their prospects for the accomplishment of this work are so encouraging. Between twenty and thirty miles of the line are now under contract, and the contractors at work, and active operations are now in progress preparatory to a second letting, which will bring the work within some sixteen miles of the city. Will not our citizens lend a helping hand for an amount sufficient to authorize this Company to put the entire line into the hands of contractors this year? We are assured that if a sufficient amount of stock could be obtained this would be done.—*Ohio State Journal.*

*Our Rail Roads.*—It must be truly gratifying to our citizens to witness the increase of travel, to and from our city since the communication between Cincinnati and Cleveland, and more especially so, when we remember that navigation is not open on the lakes and that there is nothing unusual going on at this time in the capital, to attract visitors to travel. Our attention has been directed within the last week by Judge Mitchell, the President of the Columbus, Piqua and Urbanna railroad, and Ira A. Bean, Esq., of Urbanna, one of the directors of this road, to a map respecting the important points to be connected by this new link in our chain of railroads, which we hardly knew before was in progress. It is highly gratifying to learn from these gentlemen, that our friends North-west of us, in view of the important connections being formed here, have resolved to fill up the link between Columbus and Indianapolis, by constructing a railroad running from this point in a north-westerly direction through Urbanna and Piqua to the State line, intersecting the Indianapolis and Bellefontaine road, thus opening at once a direct line of communication between from east to west, diverging at the capital over the Cleveland road by way of the Lake route, and east and south-east, to Washington, Baltimore and Philadelphia, over the Central road, by way of Wheeling. We were still more gratified, and even surprised, to learn that our wealthy and enterprising farmers, throughout that rich portion of Ohio which is tapped by this road, have come forward in accordance with the spirit

of the age, and sustained the efforts of the company, by their subscriptions of stock, as to fully warrant the board in already letting between 20 and 30 miles of the line, and to resolve to put under contract the balance of the line as far east as big Darby advancing within some 16 miles of this city. All this has been accomplished by our western friends, who are struggling to get a connection with us, without the aid of one dollar from this city. Our county and city, as well as many of our wealthy and enterprising citizens, came forward and extended a helping hand to each of our other roads, and shall we withhold our hearty co-operation from this important enterprise? When we know that the stock of the Xenia road, which has been running less than a year, is selling at par, we cannot suppose that those of our citizens who are deeply interested in the upholding of the city, can be wanting for inducements to aid in this work. We are assured by many that they will aid, and we say to our western friends that they will.—*Ohio Statesman.*

*Cleveland and Pittsburgh Railroad.*—The Cleveland *Herald* of the 12th inst. says:—To-day the Cleveland and Pittsburgh railroad is completed to Ravenna, and trains will run regularly between that point and Cleveland after this week. The company are making arrangements for the erection of large Depot buildings here, and are now building a turn-table forty feet in diameter, which is a superior specimen of heavy timber work. The Ohio stage company route will be from Akron *via* Cuyahoga Falls and Franklin to Ravenna and Warren daily.

*Steubenville and Indiana Railroad.*—The *Coshocton Republican* states that the Steubenville and Indiana Railroad will be placed under contract the entire distance, between Steubenville and Coshocton, and perhaps to Dresden and Zanesville, this spring.

*Junction Railroad.*—The Elyria *Courier* says "Messrs. Ogilby & Co. have, during the last week, underlet nearly every section of the work on the Junction railroad, to Sandusky City. The work is to be immediately commenced and vigorously prosecuted until it is finished."

"It is the intention of the enterprising contractors to complete the road from this place to the junction, at Berea, early in the season; and the energy they have exhibited in the prosecution of the enterprise thus far, guarantees its early completion to Sandusky City."

### Kentucky.

The railroad from Louisville to Frankfort only lacks about ten miles at this end, of completion. An omnibus runs daily from Frankfort to the present terminus, for the accommodation of passengers. Citizens of Lexington may now leave this city by the cars in the morning, and reach Louisville by this route the same day at dinner time. Passengers by this route now reach this city in the 11 o'clock train, having left Louisville the same morning. This is the cheapest and quickest route. —*Kentucky Statesman.*

### New York.

*Opening of the Erie Canal.*—The *Albany Journal* of Friday evening says there is some prospect that the Canal Commissioners will soon designate a day for the opening of the Erie, Oswego, and Champlain Canals. The 15th of April has been spoken of by some.

The Board of Trade of Buffalo have held a meeting, at which they unanimously adopted the following preamble and resolutions:

*Whereas*, The Ohio Canal, Muskingum Improvement, and other public works of Ohio, affording water communication between Lake Erie and the Ohio River, are now open at their southern extremities, and will be open through their entire length before the first of April.

*And Whereas*, The Pennsylvania Canals are now in active operation, and from the greatly reduced cost of transportation by that route since the recent reduction of tolls, and the advantage of from six to eight weeks earlier access to tide-water—will divert a large amount of produce from the Erie Canal route, until the opening of our canal.

*And Whereas*, Reliable information has been communicated to members of this Board, by millers and other shippers of produce in Southern Ohio that they are now shipping via the Ohio River and Pennsylvania Canal, but desire to ship by Lake Erie and the Erie Canal, whenever they can do so without a detention of their property at Buffalo.

*And Whereas*, An early opening of the Erie Canal, would secure for transportation over its waters a considerable amount of produce from various ports on our Western Lakes, which might otherwise be diverted through the Welland Canal, and down the St. Lawrence River, or over the Ogdensburgh railroad, and also of a large amount of merchandise coming from tide-water, which would otherwise be shipped over the New York and Erie and other railroads and through the Pennsylvania Canal.

*And Whereas*, The experience of past years have demonstrated that whenever a considerable period has elapsed between the opening of navigation on Lake Erie and the Canal, the expense of handling and forwarding produce arriving in the *interim* has been greatly increased, the market depressed, and owners of produce involved in losses, and rendered dissatisfied with the Erie Canal route for Spring shipments. Therefore,

*Resolved*, That in the opinion of this Board, it is of the utmost importance to the revenues that the earliest practicable period be adopted for the opening of the Erie Canal through its entire length.

*Resolved*, That the Canal Board be, and they are hereby respectfully solicited to adopt measures to ensure the opening of the Canal as early as the 5th of April ensuing, if in their opinion practicable.

*Resolved*, That Messrs. E. O. Gould, J. L. Reynolds, and M. S. Hawley be a committee to communicate the proceedings of this meeting to the Canal Commissioners.

*Resolved*, That the proceedings of this meeting be published in the daily papers of the city.

H. E. HOWARD, President.

M. S. HAWLEY, Secretary *pro tem.*

*Railroad per Canandaigua.*—The parties interested in the project for building a road from Niagara Falls to Canandaigua, of six feet gauge, to connect with the Canandaigua and Chemung roads, and so by the Erie with New York, have organized a company for that purpose, and the following officers elected:—W. H. Townshend, Isaac Seymour, Moses Maynard, Jr., H. A. Johnson, J. P. Giraud Foster, Paul N. Spofford, New York; Simeon Benjamin, Elmira; Aug. C. Porter, Niagara Falls: Benj. Pringle, Batavia; Francis Wilson Paul, Canandaigua; George Wright, Bloomfield; Saml. Rand, Honeye Falls; Ira Godfrey, Lima, as directors: Wm. H. Townshend, President; Benj. Pringle, Vice-President; Isaac Seymour Treasurer.

FARE ON THE S. & U. RAILROAD.—The fare on the Syracuse & Utica railroad will be as follows after the first of April:—

| | |
|---|---|
| From this city to Manlius, | 15 cts. |
| To Kirkville | 20 " |
| To Chittenango, | 30 " |
| To Canasaraga, | 35 " |
| To Canastota, | 40 " |
| To Wampsville, | 45 " |
| To Oneida, | 55 " |
| To Verona, | 60 " |
| To Green's Corners, | 70 " |
| To Rome, | 80 " |
| To Oriskany, | 95 " |
| To Whitesboro', | 100 " |
| To Utica, | 109 " |

*Railroad from Blossburgh to Elmira.*—There is a project on foot for extending the Blossburgh railroad to Elmira. The proprietors of that road, says the *Elmira Republican*, have resolved to relay it with a heavy T rail, but there is a difficulty between the Corning Company and the Pennsylvania Company in reference to the gauge of the track, the Corning Company insisting on the present narrow guage in order to compel trans-shipment at that place, and the Pennsylvania Co. being equally resolved to have the wide or six foot track. The arrangements, we understand, are nearly made for relaying the rail, the iron being already furnished, and unless the Corning company yield their position, the Pennsylvania Company will terminate the lease of their road now existing.

*Sackett's Harbor and Saratoga Railroad.*—The law authorizing a company to construct the Sackett's Harbor and Saratoga road, was passed April 10th, 1848. It directed the controller to sell to the company as often as it expended $25,000 east of Carthage, and paid into the treasury 5 cents per acre, 25,000 acres of land to be selected in alternate sections of not less than 1000 nor more than 2000 acres, until there shall have been conveyed to them 250,000 acres of lands in the counties of Herkimer and Hamilton. This charter gave the company three years to organize. During the last year, individuals living year the line in the counties of Jefferson and Lewis, procured the survey of the road, with a thorough exploration of the country through which it passes, at an expense of not less than $4,000. The necessary amount of stock has been subscribed, and a day appointed to meet and organize.

### Important Invention.

Mr. H. Perkins, of this city, has invented a machine for propelling Canal Boats by steam, and has filed his caveat preparatory to taking out a patent. The main principle of the apparatus consists "in the paddles getting their adhesion aft the boat—commencing to travel three feet from the stern, having a five feet stroke." This is done by having two cases ten inches square by eight feet long, sliding out of two stationary cases from under the stern deck two feet apart, and within four inches of the surface of the water, when the boat is loaded. Each of these cases contains a tongue on six wheels, travelling inside, on a rail track. In the further end of the tongue is a paddle two feet by 15 inches deep, with a joint three inches above the surface of the water, causing it to pass on the surface in its travel toward the boat. The whole is under the control of the helmsman, and the cases can be drawn out of or into the boat at any moment by his putting his hand to a lever. The apparatus occupies the room under the stern deck, projecting six feet into the cabin, and in no way lessens the bearings or capacity for storage.

Mr. Perkins is about to put one of these machines into a boat lying at the Washington-street bridge, where it may be inspected. He will use in this one of Hoard and Bradford's portable engines. The whole weight of the engine and apparatus will not exceed 2,700 pounds, and it is estimated by Mr. P. that the cost of propelling a trip round to New York will not exceed $40. The whole cost of the machine engine, and putting them into the boat, will not exceed $450.—*Buffalo Commercial Advertiser.*

### Pennsylvania.

The *Erie Observer* states the bill regulating the width of gauges of the several railroads running east and west from that city, has passed the Senate, and has, ere this, been signed by the Governor, and has become a law. This bill provides that all roads running east from the city of Erie shall be confined in laying down their tracks to the six feet and four feet eight inch gauges of the New York and Erie and the Central New York roads, and that all railroads running west, shall be confined to the four feet ten-inch gauge of the Ohio roads.

### Illinois.

*Central Railroad.*—The Auditor of the State of Illinois has made a map of the land through which the Illinois central railroad is to pass, and, it is stated, has found that the vacant lands on the main track between Cairo and Peru, granted by Congress, amount to 3,174,000 acres.

## iroad Paint.

FOR dep[illegible] buildings, bridges, burthen cars, wheels and axles, pipes, steam joints, fences, and every description of work requiring protection from the action of the elements. Price per barrel of 300 pounds, nine dollars.

Orders addressed to J. M. HALL, 36 South street, New York, will receive prompt attention.

March 18, 1851. 3m*

## UNION WORKS,

North street, opposite the Railroad Depot,
BALTIMORE.

## Poole & Hunt,

Manufacturers of Steam Engines and Mill Gearing, Machinists' Tools, and all kinds of heavy and light Machinery.

Also put up *Arrangements of Wrought Iron Pipes* for heating buildings and conveying steam or water.

Castings of every kind furnished at short notice.

Every exertion will be made to insure the satisfaction of customers.

## Smith & Tyson,,

IRON COMMISSION MERCHANTS,
BALTIMORE.

REFINED Juniata Charcoal Billet Iron for Wire.
Do. for Bridging, of great strength.
*Flat Rock*, Boiler and Flue Iron, rolled to pattern.
*Elba*, Wheel Iron of great strength and superior chilling properties. Elba Forge Iron, American Shot Iron, Cut Nails, Spikes and Brads, Nail and Spike rods, Railroad Spikes of superior quality, Wrought Chair plates of any pattern, punched or plain.

## Railroad Spikes, Wrought Chairs and Fastenings.

THE subscribers continue to manufacture, with increased facilities, Hook and Flat Head Railroad Spikes and Chairs. The points being FINISHED BY HAND, have a long taper, and sharp point, and are much superior to those made entirely by machinery.

We are also prepared to furnish Wrought Chairs, Clamps and Fastenings of every description, either punched or plain. The best quality of refined iron is used in the above articles, and our prices will be made as favorable as any in the country.

The patent Clinch Spike will be found an improvement to secure the rail at the joints. They drive in the manner shown and are not liable to work loose.

All communications, addressed to the undersigned, will meet with prompt attention.

SMITH & TYSON,
No. 25 South Charles st., Baltimore Md.

## Car Wheel Iron.

THE celebrated cold blast "Conowingo" Pig Iron, for Railroad Wheels, Chilled Rolls, etc., for sale by E. PRATT & BROTHER,
Baltimore, Md.



**AMERICAN RAILROAD JOURNAL.**

**Saturday, March 22, 1851.**


### The Stock and Money Market.

The stock market continues dull, and new securities are not much in request, though there is no lack of money, there is an unwillingness to enter into new transactions, till the future shall have disclosed itself. Those who have bonds or stocks to offer, for the purpose of raising means for works in progress, will find it for their interest not to offer them for the present. The market has not yet recovered from its recent reaction. A gradual improvement will undoubtedly soon take place—as soon as the season is a little more advanced.

Business of all kind is dull, and prices, particularly in the dry-good line, are receding. The spring trade by no means comes up to the expectations of our merchants. We think this may be accounted for, to some extent, by the influence of railroads, which enable the country dealer to supply himself at an instant's notice, and do an equally good business upon a much smaller stock than formerly. When weeks and months were required to transport his goods to his place of business, he could conveniently purchase only twice a year.—He can now order, and be supplied as speedily and cheaply, at one time as at another, and he keeps on hand only what is wanted for his immediate calls, and buys as he sells. The aggregate is the same, but divided over the whole year. Our merchants have not adapted their business to this change in the position of their custamers, hence the complaint which we have noticed.

Another cause which checks operations, is the large amount of capital required for the new banks which are about going into operation in this city. The calls for this purpose equal several millions of dollars. The same cause is operating to some extent in other large cities. The ultimate effect will be an increased abundance of money, as soon as these banks shall go into operation, though the present tendency is to draw a large amount from circulation.

SALES OF STOCK IN NEW YORK.

| | March 19. Sales. | March 12. Sales. |
|---|---|---|
| U. S '67 Loan..... | 115¼ | 116 |
| Erie R.R..... | 81 | 80½ |
| Harlem R.R..... | 68¼ | 67½ |
| Stonington..... | 41½ | 42 |
| L.I. R.R..... | 23¼ | 23½ |
| Norwich & Wor.... | 63½ | 63 |
| Del. & Hudson..... | 129½ | 133½ |
| Reading ..... | 59½ | 60½ |
| Morris Canal..... | 18½ | 18 |
| Erie income ..... | 93½ | 91½ |
| " " Bonds. | 103 | 104 |
| Canton..... | 62 | 55 |
| Farmers Loan..... | 63½ | 67½ |

SALES OF STOCKS IN BOSTON.

| | March 18. | Mar. 11. |
|---|---|---|
| Old Colony Railroad..... | 69 | 68¾ |
| Boston and Maine R.R. .....104½ | | 105½ |
| Eastern Railroad.....102¾ | | 103¾ |
| Fitchburg Railroad.....111¾ | | 111¾ |
| Michigan Central Railroad..... | 94½ | 92 |
| Northern Railroad..... | 70¾ | 68½ |
| Vermont Central Railroad:..... | 34½ | 34½ |
| Vermont and Mass. R.R..... | 29 | 28½ |
| Western Railroad.....105 | | 105¾ |
| Ogdensburg Railroad..... | 39 | 39½ |
| Rutland Railroad..... | 59 | 58½ |
| Boston and Worcester Railroad. | 103¾ | 104 |
| Rutland Railroad Bonds..... | 88 | 85 |
| Ogdensburg Railroad Bonds..... | 97½ | 99 |
| Vermont Central R.R. Bonds.... | 92½ | 92 |
| Boston and Providence R.R..... | 83¾ | 83¾ |
| Philadelphia, Wilm'gton & Balt. | 30¼ | 29½ |
| Concord R.R..... | 56 | 55½ |
| Manchester and Lawrence..... | 90 | 90 |

### The Compound Rail.

The subject of substituting a continuous compound rail for the one in present use, is now attracting much attention on the part of those interested in railroads. The defects of the common form are admitted, and there is a general belief that they can be remedied. If so, a great revolution will be effected in the expense of operating roads.

The two kinds of compound rail which have been subjected to the most satisfactory test, are those invented by Mr. Seymour and Mr. Latrobe, of which we have already given a minute account. The former has already been in use with great success upon two roads, the Utica and Schenectady and the New York and Erie. The Hudson river railroad company have just ordered a quantity for that road. The Reading company are now laying a few hundred tons by way of experiment. A number of other companies are also about to make similar trials of it. If these tests should prove satisfactory, we may expect that the compound rail will altogether supersede the present form. In five years from this time, we do not believe that any other but the compound rail will be used, so decidedly superior has it proved itself thus far.—We would advise all companies that are purchasing iron, to order at least a sufficient quantity to test its merits on their own roads. They should remember that the expense of the rail makes up a large portion of the aggregate cost of railroads, and that the adoption of the common rail will preclude in most cases the use of the compound article for many years; and if the latter possesses the superiority claimed, it will give a great advantage to those using it over the companies that do not.

The Seymour rail has thus far been manufactured at the Mount Savage Works in Maryland, where the rail designed for the Hudson river road is now being rolled. The quality of all the iron that have been used has given great satisfaction.

The safety which must result from the use of the compound rail upon curves, and upon bridges and culverts, should at once cause it to be used in all such places. The weight of a certain quantity of rail will serve the office of abutments, and upon bridges of ordinary span, would alone sustain a train, without any support from the bridge.

### Remarkable property of Steam connected with the theory of the Steam-Engine.

Mr. J. P. Joule, F.R.S., has communicated to the *Philosophical Magazine*, No. 251, a letter from Professor W. Thompson, containing an explanation of the true cause of the non-scalding property of Steam issuing from a high-pressure boiler. The proposition (announced by Mr. Rankine) is certainly one of very great importance; as it would appear from it that when saturated steam is allowed to expand so as to evolve work, a part of it is condensed, and that this condensation affords heat for the expansion of the remainder of the steam.

### North-East Railroad.

We learn, says the *Erie Gazette* of Tuesday, that at a meeting of the board of directors of the Erie and North-East railroad company, on Monday evening, it was resolved to immediately commence grading a track, parallel with the route of the Erie and North-East road, for the accommodation of the Buffalo and State Line Road. The two tracks—six foot and four foot eight and a-half inches—are to be finished and in running order on the first of August next.

### Marine Propulsion.

A question of considerable interest, in respect to steam navigation, has been argued before the Judicial Committee at the Privy Council-office, Whitehall, Lords Brougham, Campbell, and Langdale, Dr. Lushington, and Mr. Pemberton Leigh, being present. An application was made by Sir Frederick Thesiger, on behalf of the patentees of the screw propeller, for an extension of their patent which would expire shortly. The evidence went to prove that no less than 30,000*l.* had been expended in building the *Archimedes*, and in defraying other weighty charges to establish the Screw-propulsion principle; and it further appeared, that although no less than 32 ships-of-war and 100 mercantile steam vessels had been constructed already upon this system, not more than two or three had paid for the patent licence. These evasions had been occasioned by the conflicting claims of five different patentees; but, as these have now united in one Association, it is expected that all who have adopted the use of the Screw-propellor will have to pay for their licences. As the admiralty are interested, either directly or collaterally, in this question to the amount of about 25,000*l.*, Sir John Jervis, the Attorney-General, assisted by Mr. Crowder, Q.C., opposed the application for an extension of Mr. Frank Pettit Smith's Patent; but, after examining Captains Chappell and Crispen, R.N., and

Messrs. Brunel and Galloway, engineers, their lordships decided on granting an extension of five years to Mr. Smith's patent upon certain conditions. —*Times.*

### Ohio.

*Eaton and Hamilton Railroad.*—The line of this road extends from Hamilton, on the Cincinnati, Hamilton and Dayton railroad, in a northwesterly direction to the Indiana State line where it will connect with the Richmond and Indianapolis railroad, now in project, to the latter place. The whole line of the Eaton and Hamilton railroad has been put under contract, and the work of grading is in vigorous progress. The length of the road is 36 miles, with a maximum grade of about twenty-five feet to the mile, occurring but seldom, and then but for short distances. The remainder is at an average grade of some sixteen feet to the mile. Practically, as to curvature, it may be put down as a straight line. The minimum curvature is about six thousand feet radius. Its estimated cost when fully finished and ready for business is $500,000. Of this sum the company last fall, by a vote of the people of Cincinnati, obtained a loan of credit of $150,000 for twenty-seven years. Of this sum they have received $25,000. The individual subscriptions, which are on the increase, amount to $150,000, making the present resources $300,000. The amount in the treasury is $20,716 56. If the instalments coming due are promptly met, the directors expect that one division of the road can be put in operation in the latter part of next fall, or early in the winter.

This is the first road that branches from the Cincinnati, Hamilton and Dayton railroad in the west, and will become the trunk line for a large amount of business, not only of the country traversed, but of the roads in progress through Indiana with which it will connect. It will constitute a part of one of the routes between Cincinnati and Indianapolis, and will unite the former city with the great northwest. It traverses Preble county, one of the best in Ohio, centrally, and being removed from competition for its appropriate local business, it cannot fail to be a remunerating enterprise.

### European and North American Railway.

The realisation of this grand project is not so distant as some may have imagined. It is rapidly making its way through Maine. The construction of the link from Waterville to Bangor may be regarded as secured by the action of the stockholders of the Atlantic and St. Lawrence railroad, authorising a lease of the former. Measures are also in progress to build a railroad from Bangor to Oldtown, on the route proposed for the European and North American railroad, a distance of 13 miles, and the most expensive part of the line from Bangar east. These two links will leave only some 80 or 90 miles in Maine to be secured; for which provision is very likely to be made in the shape of grants of proceeds of the public lands of Maine. The subject of aiding this road by similar grants, is now before the Massachusetts legislature, with some prospect of success.

In New Brunswick and Nova Scotia, we have the best reason to believe that the Provincial guarantees will supply any lack of individual subscription, even if the home government shall not render any aid. The people of the provinces are fully impressed with the importance of this work. They regard its success as the turning point with them, whether they shall continue to retrograde in all their material interests, or start on a new career of progress. Through the Provinces the road *must* be built. Both there and in Maine the project has advanced with wonderful rapidity since its first announcement; vastly more so than the other great work of Maine, the Atlantic and St. Lawrence railroad, the completion of which a little more than a year will witness.

When the European and North American railroad shall be extended to the most eastern point of Nova Scotia or Cape Breton, we shall have then reached the *ultima thule* of railroad progress in the east. We must then turn our eyes in an opposite direction toward our western limit, the Pacific ocean. We shall then span the continent at its widest practicabl points.

### Canada.

*Western Railroad.*—A bill is now before the New York Legislature authorizing the railroad companies of the state to subscribe to the stock of the above company. The Canadian Government loans its credit to the company to an amount sufficient to build one half of the road, and about $1,500,000 has been subscribed in addition, in the Provinces. One million more is necessary to complete the work, and this is sought to be raised in the States. Of this sum, the railroad companies between Albany and Buffalo propose to take an amount which will probably not exceed two and a-half per cent. of their capital.

### Missouri.

This State has agreed to loan its credit to the Pacific railroad, extending from St. Louis to the Kansas river, to the amount of $2,000,000; and to the Hannibal and St. Josephs railroad, to the amount of $1,500,000. The loans are to be secured by mortgages of the roads as they progress. Whenever $50,000 of private means shall be expended, the State is then to issue and deliver its bonds to the railroad companies to an equal amount. The aid extended by the State will, we presume, be increased so as to furnish one-half of the whole sum necessary to complete both lines.

The Pacific railroad will be about 300 miles long, and is estimated to cost $6,000,000. The whole route has been surveyed the past season under the direction of J. P. Kirkwood, Esq., Chief Engineer of the company, and has been found to be very favorable. We learn that the southern route, following up the valley of the Maremac, and keeping the prairie lands at a distance of 40 or 50 miles from the Missouri, in some places, is likely to be adopted. The river route, as it is termed, would be somewhat shorter and cheaper; but the line here would come into direct competition with the river, which would draw off at some seasons a large portion of the heavy freight. The lands immediately bordering the river are all settled, and are under a high state of cultivation, while those more remote have, for the want of suitable means of transportation, been almost entirely neglected. The road would at once bring these into market and be the means for settling them, and would add largely to the productions of the State and the business of St. Louis. In addition to these considerations, the southern route would traverse one of the finest mineral districts of the United States, abounding in vast quantities of iron, lead, copper, and other less valuable minerals. These remain almost entirely unwrought, from the present difficulty of expense of transportation.

We learn that the construction of this line is to be commenced at once. With the means which the company have at command, it should be completed in three or four years. The city of St. Louis can easily raise one-half of the cost of the work, and as the State will probably contribute the other half, there can be no lack of means.

The Hannibal and St. Josephs route is shorter and less expensive. The north side of the river is more favorable for a railroad than the south. The latter company have not the advantages of a large city to fall back upon for means, but the country traversed can furnish a much larger amount than the country south of the Missouri, and we see no reason why this road should not be completed as soon, to say the least, as its rival line. The Hannibal and St. Joseph railroad is to be commenced immediately. The last number of the Hannibal Courier states that Col. R. M. Stewart, the President of this road, will, upon the adjournment of the Legislature, enter at once upon his duties, with the intention of pushing forward with vigor the work of surveying and marking out the road.

### Cumberland Valley Railroad.

Since the last annual report (15th) was made, the whole line of this road, 52 miles in extent, has been entirely relaid, at a cost of $268,696 17. By the completion of the York and Cumberland road, the line is connected, through the Baltimore and Susquehanna road, with Baltimore city; and when the Dauphin and Susquehanna road forms a connection with the Pennsylvania railroad, a communication will be opened to the coal mines of Pennsylvania. The whole cost of the road, up to the first of the year, was $1,187,749 98. The capital stock of the company is put down as follows, viz—6,900 preferred shares, = $345,000; second do. do. 7050 = $352,500; old shares, 7754 = $387,700; held by company, 1700 = $85,000; mortgage loan due 1st October, 1859, $13,000; or a total of $1,183,200. The bonds created under this mortgage amount to $31,800, of which sum there has been used but $13,000. Of the balance, $7,800 has been paid in liquidation of debts to the Carlisle Bank and others. The residue, $11,000, will, perhaps, be applied to pay off a debt now due to the Chambersburg Bank. The assets of the company are stated at $58,639 82, and its liabilities, including the $11,000 due the Chambersburg Bank, at $38,533 57. Its revenue is put down as follows:—Balance 1st Jan., 1850, $23,392 33; receipts for 1850, $92,755 78, making a sum total of $116,148 11. From this is to be deducted $47,377 53 for expenses, repairs, and interest, leaving $68,770 58. From this amount is to be deducted the dividends of April, 1850, of $19,990 60, and that of October of $24,123 75, showing a balance of $24,656 23.

The whole amount of receipts for the past year amount to the sum of $363,771 28, and is made up of the following items:—Cash on hand 1st January, 1850, $70,056 68; instalments of first preferred stock, $183,168 51; earnings for last year, $92,755 78, bills payable, $6,500; old debts collected, $58 87; interest received on deposits, $1,598 61; tolls outstanding 1st Jan., 1850, $9,632 83. The expenditures are for construction, $261,128 32; expenses, ordinary and extraordinary, $43,152 82; interest, $2,348 01; debts due prior to 1850, $3,340 23; dividends, (4 per cent semi-annually) $44,114 35. Balances of interest due on funded bonds $183 00; outstanding tolls, $4,982 24; sundry items, $1,569 56; cash on hand, $2,952 75.—Of the total amount of tolls, $92,755 78, $35,838 94 were received from passengers, and $41,298 10 for freight, including $100 for express packages.

### Georgia.

*Muscogee Railroad.*—This road commences at the town of Columbus, and is 50 miles in length. Of this distance, 25 miles was located in the latter part of the year 1848; and there had been finished, at the close of 1849, work to the value of $36,843 33. The location of the remaining 25 miles was completed by about the 1st March, 1850. The maximum grade is 39·6 feet. The length of curve on the whole work is 8¼ miles. Of straight line there are 41¼ miles. The graduation and masonry of the last 25 miles has been let to contractors, under stipulation for its completion by the 1st of November next.

The superstructure for the road has been contracted for at $1,500 per mile. The value of work done up to January 6, 1851, is $66,474 59. The cost of the road, including equipment, is estimated at $497,979 71, and is made up of the following items: graduation, masonry and bridging, $161,979 71; 52 miles superstructure, including turnouts, $78,000; iron, (50 tons to the mile) plates and spikes, $122,000; right of way, $6,000; real estate, depots, shops and water stations, $20,000; engineering, etc., $25,000; and equipment, $85,000.—The estimated receipts of the first year's business are $116,000; estimated expenses of working the road, $46,000—leaving a balance of $70,000, or 14 per cent. on the capital stock ($500,000). The operation of this road is expected to secure to Columbus all the benefits expected to be reaped from the trade of Upper Georgia and Tennessee, by her connection with the Macon and Western railroad at Barnesville, as also those arising from a reliable outlet, such as this line connected with Montgomery and the Alabama river presents.

### Indiana.

*Lawrenceburgh and Upper Mississippi Railroad.*—This road extends from Lawrenceburgh, on the Ohio river, 20 miles below Cincinnati, to Indianapolis, a distance of 90¼ miles; passing through Greensburgh, in Decatur, and Shelbyville, in Shelby counties—of which these two towns are county seats. It intersects at the latter place, the Shelbyville, the Shelbyville and Knightstown, and the Shelbyville and Rushville railroads; for these it will open a direct outlet to Cincinnati. At Indianapolis it will form a junction with the principal roads now constructing in the State. The company have also the right to construct a road from Greenburgh, by Evinsburgh and Martinsville, to any point on the western boundary of the State they may choose. The whole cost of the road, including equipment, is estimated at $1,050,210; at which rate, the average cost per mile would be $11,573. About 63 miles of the work are under contract, and 20 miles will be ready for the iron by the time it can be delivered. The payments to be made for contracts already entered into for its construction, are $151,941 in cash, and $117,884 in stock and real estate. Some $70,000 has been expended on the work; but this sum does not cover the expense of the real amount of work done, the contractors not having, in all instances, called for the stock and real estate portions of their work; as they intend to wait until the final estimate is made. The resources of the company are, in cash $130,000; in real estate, $125,000; in work and materials, $37,000; in city of Lawrenceburgh 6 per cent bonds, $40,000; and in county of Decatur 6 per cent bonds, $100,000—making a total of $432,000. Subscriptions are constantly being made, payable in cash, timber and real estate. The cash subscriptions are payable, generally, in one, two and three years, commencing in 1849. The company have received the full amount—$40,000—of the Lawrenceburgh city bonds, and $30,000 of those of Decatur county. The residue of the latter will be delivered as the work further progresses. The only debts of the company are $5,000 for loans—which are not yet due. For the purchase of iron for rails, etc., the city and county bonds are proposed to be set apart. The company propose to have, by the 1st of next December, 20 miles of road in operation, and 43 more ready for the superstructure. This company was chartered in 1848, and, at that time, bore the name of the Rushville and Lawrenceburgh company. The amount of capital stock authorised is $100,000; although right is possessed to increase it to any amount desired.

This road will traverse a very fertile region, and it will connect the central part of Indiana with Cincinnati by the shortest practicable route. Its stock cannot fail to be a very profitable investment.

The distance from Cincinnati to Lawrenceburgh will be constructed by the Ohio and Mississippi railroad company.

### Queenston Suspension Bridge.

This second structure which spans Niagara River has recently been open to the public. The towers are built on each side, and it is 1043 feet from tower to tower, and it seems quite fitting that this great work should tie together with iron cables the great dominions of the two greatest nations in the world. There are to be ten cables in all, each cable made of 250 wires, each wire warranted to bear 1500 lbs. The wires are not twisted but lie together straight, and are kept together by a strong wire that is wound around them, the same as you would wind a thread around a bonnet wire. The cables are firmly anchored in the rock, and pass over two massive stone towers, some 14 feet high. On the top of these towers are solid iron plates, and rollers on these, upon which are other plates with groovings for each of the cables, so that there is no horizontal strain upon the towers, but all the pressure is perpendicular on the same principle with the pressure on the bridge under the strings of a viol. The cables when extended have the shape of a rainbow turned upside down, and to the uninitiated it would seem that a bridge built on these cables would give a merry run down to the centre, and then be up hill to the opposite side. But instead of the planking and pathway being over the cables it is under them, and is to be perfectly level. The centre of the bridge will nearly touch the centre of the cables, while at either end it will be 60 or 70 feet below them, and the work to be sustained by iron rods suspended from the cables. A road has been cut along the side of the mountain to either terminus of the bridge, where solid walls of masonry have been built. The planking is to be twenty feet wide, intended at present for teams; but the towers and iron plates are constructed so that extra cables can be run over them. It is said to be the greatest suspension bridge in the world.

### Bridge at Rouse's Point.

We are sorry to see the opposition in the Legislature of this state to the project for bridging Lake Champlain at Rouse's Point. We can see no good reason for it. The refusal of the charter would be a direct violation of the spirit of the present railroad law of this state, which allows every section to build such roads, and in such direction as shall best promote its interests—New York having thus set an example worthy of all imitation, by her sister states. Should not this practically repudiate the principle which lies at the foundation of this law. We hold that no one state has a right to interfere for its own benefit, with the trade between other states, neither has it the right to refuse to one portion of its citizens, privileges which are granted to another. Any assertion which is based upon a wrong, cannot be sustained, and if a large number of the inhabitants of the northern part of this state would be benefited by this bridge, it must be built in spite of the present opposition—the right in the end is sure to prevail over all selfish considerations. But we think that the people of this state would generally be benefitted by the bridge proposed, they could not be injured by it. Allowing that a large amount of produce would come over the Ogdensburgh railroad to Lake Champlain, all such produce would come to New York instead of going to Boston, except what would be wanted there for domestic consumption, and this petty privilege we should grudge to any of our sister states. Rouse's Point is commercially much nearer to this city than Boston, and of course any avenues opened to that point should secure an encouragement, New York would retain her position as the great shipping port of the produce of the north and west, with as much certainty, if the Ogdensburgh railroad should become the sole route of this produce to a market, instead of the Erie Canal. A barrel of flour can be taken from Rouse's Point and delivered in New York, for one half of the cost of its transportation to Boston, with all the railroads that can ever be built to the latter city. Let us not in violation of our declared principles reject an application upon false grounds of expediency, when it can be conclucively shown that we should be benefitted rather than injured by granting it.

### British Navy.

The following is a return made up to July 30, 1849, of the number of Sailing and Steam Ships of her Majesty's Navy:—Of *Sailing Vessels*—19 first rates, mounting from 110 to 120 guns, and ranging from 2612 tons to 3,394; 52 second-rates, mounting from 78 to 104 guns, and ranging from 1,954 tons to 3,165; 20 third-rates, mounting from 70 to 72 guns, and averaging from 1,742 tons to 2,214; 40 fourth-rates, mounting from 50 to 60 guns, and ranging from 1,458 tons to 2,147; 42 fifth-rates, mounting from 36 to 44 guns, and ranging from 946 tons to 1,634; 31 sixth-rates, mounting from 10 to 28 guns, and ranging from 500 tons to 1,082; 85 sloops, corvettes, and brigs, mounting from 3 to 18 guns, and ranging from 227 tons to 363; 11 packets, mounting from 4 to 6 guns, and ranging from 182 tons to 362; 14 surveying vessels, mounting from 2 to 22 guns, and ranging from 73 tons to 516; 5 troop ships, mounting from 2 to 22 guns, and ranging from 501 tons to 1,709; 1 store ship with 2 guns, of 314 tons; and 29 cutters, schooners, and tenders, mounting from 2 to 6 guns, and ranging from 25 tons to 330. Total of sailing vessels, 339.

Of *Steam Vessels* there were—3 line of battle ships of 80 guns, ranging from 2,335 tons to 3,074; 4 guard-ships of 56 guns, ranging from 1,761 tons to 1,846; 4 frigate guard-ships of 24 guns, ranging from 1,060 tons to 1,228; 22 frigates mounting from 6 to 36 guns, and ranging from 1,190 tons to 1,980; 64 sloops mounting from 2 to 6 guns, and ranging from 649 tons to 1,278; 26 gun-vessels, mounting from 2 to 4 guns, and ranging from 284 tons to 557; 4 schooners, of 8 guns, ranging from 490 tons to 516; and 34 tenders, &c., mounting from 1 to 3 guns, and ranging from 42 tons to 1,034. Total of steam vessels, 161.

In addition there were 47 steam vessels, ranging from 225 tons to 1,800, employed as packets under contract, and capable of being made available for warlike purposes in case of emergency.

### Railroads and Common Roads.

We happened, a few days since, to be upon one of our wharves, when we saw two loads of sugar box shooks being landed on the wharf, one load by the cars from Waterville, and the other on a team from Buxton. On enquiry, we learned that the frieght of the former—82 miles by railroad—was but five cents per box, and of the latter, only sixteen miles, nine cents. The iron road thus makes Waterville but five-ninths the distance to Buxton,

by the "county road," and the Kennebec river at Waterville, is now nearer to us than the Saco is at and above Buxton.—*Portland Advertiser.*

### Georgia

*Muscogee Railroad.*—On the 6th of January last a committee was appointed by the stockholders of the Central Railroad and Banking Company of Georgia, to report the condition of the above company, and its ability to complete the route of 50 miles within a reasonable time; and also the cost of constructing 21 miles of line, and the best method for its expenditure, and whether it should be by subscription to the stock of the company, or by subscription to the stock of the Southwestern company, (its charter being amended for that purpose) or in some other and what way. The report states that the Muscogee company are steadily going on with the work, and that one-half will probably be put in business operation by the 1st of next October. The committee think that the whole line can be completed and ready for running by the same time in 1852. The cost of 21 miles of the road will be $298,706,55, or $14,224,12 per mile. The report recommends that this amount be raised by a subscription of $100,000 respectively, from the Central railroad company, the corporation of Savannah, and from individuals—the money thus raised to be expended by subscription to the Southwestern company, of whose road the 21 miles are to be a part. That immediately upon the subscription of $200,000 the Southwestern company proceed to call in instalments of 15 per cent. every 60 days, and commence the construction of the 21 miles as quickly as possible.

### Memphis and Charleston Railroad.

We learn from Mr. R. C. Brinkley who has just returned from New Orleans, that the subscriptions to this great work in that city before he left had reached $70,000 dollars, and no doubt was entertained that they would in a few days amount to $200,000. One gentleman alone, Mr. James Robb, had subscribed $30,000. Mr. R. is one of the most patriotic and public spirited sons of the south, and for this, and various other recent acts of munificence, deserves to be held in grateful remembrance by all the friends of progress and internal improvement in the land. His subscriptions to public works within the last three months, we are informed, amount to near $150,000.

We also learn from Mr. Brinkley, that Gov. Jones intends to remain some time yet in New Orleans, continuing the prosecution of his labors in the great cause to which he has devoted all the powers of a brilliant mind, and the hurculean energies of a character that knows no such word as FAIL. Already in sight of the goal for which he has so long toiled, the day cannot be distant when he will reap the well-won rewards of triumphant success.—*Memphis Eagle.*

### Indiana.

*Opening of the Indianapolis and Peru Railroad.*—On yesterday, agreeably to notice, the opening of the Indianapolis and Peru railroad to Noblesville, 22 miles, was celebrated at the latter place. At 8 o'clock, A.M. a train of open cars, loaded to overflowing with ladies and gentlemen from our city, started amid the cheering strains of music from Downie's Brass Band. At every cross-road crowds of anxious and astonished native Hoosiers were waiting to get their first sight of the iron horse, and as he foamed and puffed along, we were greeted with cheering and waving of handkerchiefs. At half-past nine the train entered the streets of Noblesville, where hundreds of persons were already awaiting our arrival. A train containing a number of the citizens of Noblesville, and the Noblesville Band went down soon after our arrival.

At 11 o'clock most of the people met in the Court-house to hear an address from Governor Wallace, which was delivered in his usual able style. During the day every one amused themselves as best suited their temperaments. Some promenaded the streets listening to the strains of sweet music from *our* band, whilst others visited their old friends and acquaintances.—We observed our friend Biddle astride of a horse which some one had brought to town to sell, and which he was crying off at "only forty dollars, going! going!" But the attraction of the place was the Ladies Fair for the benefit of the Presbyterian Church. It was numerously attended, and was gotten up in good taste, especially the dinner, which all seemed to relish with pleasure. At a little before four o'clock three trains left Noblesville for Indianapolis, where all arrived in time for tea, well pleased with the trip. Long live Noble[illegible] and its hospitable citizens.

The opening of this railroad will bring to our city the trade of Hamilton and Tipton counties, which will aid in increasing the prosperity of the RAILROAD CITY.—*Indiana Stateman.*

*Northern Indiana Railroad.*—We see it stated that the stock of this road to the amount of about $1,000,000 has been subscribed, a large portion of it by capitalists in this city. This secures the completion of the road to Chicago within the time estimated by the company. The *South Bend Register* states that the above road is progressing rapidly in Elkhart county, the superstructure is being laid down. The contract for bridges across the Big Elkhart the Little Elkhart and the Babaugo Rivers, have been let, and the contractors are now getting out the timber. Contracts have also been made for most of the grading, from the Little Elkhart (a mile east of Bristol) to the village of Elkhart, and hands are now at work along the line. The road will, in all probability, be completed to South Bend by the 1st of September next.

### Coal Cleared at Akron.

The following statement, which has been collected from official documents and books, by Frederick Wadsworth, Esq., the late canal collector at this port, will afford some idea of the important mineral resources which lie embedded all around us, and the rapidity with which they are being developed. It will, at the same time, show the richness of one of the sources of revenue for railroads and plank roads, which await the movements of enterprise.—*Beacon.*

| Years. | Tons. |
|---|---|
| 1838 | 323 |
| 1839 | 723 |
| 1840 | 4,458 |
| 1841 | 15,459 |
| 1842 | 15,828 |
| 1843 | 12,663 |
| 1844 | 17,876 |
| 1845 | 30,576 |
| 1846 | 29,918 |
| 1847 | 42,250 |
| 1848 | 64,358 |
| 1849 | 60,885 |
| 1850 | 80,458 |

### Virginia.

*Seaboard and Roanoke Railroad.*—We learn from the Norfolk papers, that the stockholders of this company have unanimously adopted resolutions for an early survey of the line from some point on their road between Meherrin river and Weldon, to some point on the Roanoke at or near Halifax, N. C. The board of directors were invested with full power to take such course in regard to the termination of the road in North Carolina as the best intersts of the company may demand.

### Ohio.

*Railroad to Cleveland.*—The completion of this great work will not only contribute to the social intercourse and good fellowship between the cities of the northern and southern termini, and between the cities and villages along the line, and it will augment largely the business transactions between the citizens respectively.

This road was opened on Friday last to invited guests, and on Monday the first passenger train for the public generally passed over the route from Cleveland to Columbus, and we noticed in our city on yesterday, several Cleveland merchants and traders, who had never before been here, and who came to purchase goods to replenish their stocks.

The business intercourse has began and will increase, and social intercourse and good fellowship will follow.—*Cin. Gaz.*

### Illinois.

The corporators of the Illinois Central railroad met in this city to-day, at the office of Messrs. Robert & George Schuyler, and organized that company by voting to accept the charter granted by the State of Illinois, and by the election of Robert Schuyler as President. The directors are:

| | |
|---|---|
| Robert Schuyler, | Robert Rantoul, Jr., |
| Jonathan Sturgis, | Goveneur Morris, |
| Franklin Haven, | J. F. A. Sanford, |
| Henry Grinnell, | Wm. A. Aspinwall, |
| George Griswold, | Thos. W. Ludlow, |
| David A. Neal, | Leroy Wiley, |

Jos. W. Alsop.

Gov. French is also a director *ex-officio.*

### Georgia.

*Atlanta and West Point Railroad.*—We understand that the work upon the above road is progressing rapidly. On Saturday last, the cars commenced running regularly from Atlanta to Palmetto, a distance of twenty-five miles. Between Palmetto and Newnan the work is in such a state of forwardness, as to justify the belief that the cars will reach Newnan in the early part of the summer. The great mail has already been transferred to this route, over which it will probably be carried, at least until the completion of the Girard and Mobile road. By the way, it is but justice to Mr. Grant, the engineer, and to the stockholders of this road to say, that it is one of the best structures of the kind in the State. The embankment is ample, the superstructure substantial, and the iron very heavy and well laid. This is the judgment passed upon the road by an engineer of decided ability, who recently examined a large portion of the line.—*Macon Journal.*

### New York.

*New York and New Haven Railroad.*—The receipts of the New York and New Haven road continue to show a very large increase over the same period of last year. The earnings for February were, after paying off all connecting roads:—

| | |
|---|---|
| 1851 | $50,726 48 |
| 1850 | 30,300 11 |
| Excess 66¼ per cent | $20,426 37 |

The aggregate traffic of January and February was:—

| | |
|---|---|
| 1851 | $106,723 |
| 1850 | 60,523 |
| Increase in two months over 75 per cent | $46,199 |

### Maryland.

*Baltimore and Ohio Railroad.*—The following are memoranda of the business upon the Baltimore and Ohio railroad, for the month of February, 1851:

| | | |
|---|---|---|
| Main stem | $27,567 98 | $90,402 11 |
| Washington branch | 22,048 59 | 4,236 80 |
| | $49,616 57 | $94,638 91 |

Making an aggregate of $117,970 09 on the main stem, and $26,285 39 on the Washington branch—the total being $144,255 48.

The above, compared with the corresponding

month of last year, shows an increase of $16,086 16, being $13,249 74 on the main stem, and $2,836 42 on the Washington branch.

### Atlantic and St. Lawrence Railroad.

Messrs. John McConnell, (member of Provincial Parliament,) and H. B. Tirrell, Esq., of Stanstead, Canada East, and N. Colby, Esq., of Derby, Vermont, are on a visit to our city, as a committee in reference to the location of the Atlantic and St. Lawrence railroad line in Vermont. They desire a detour to the westward some miles from the located line—a change, which in their opinion, fortified by statistics, will be of much advantage to the business of the road, over the present location. A majority of them went up to Bethel yesterday on the occasion of the opening to that town.—*Portland Advertiser.*

### Vermont.

*Rutland Railroad.*—We learn that the Burlington Free Press, of the 8th inst., that Judge Bennett has granted the injunction prayed for by Mr. Byron Stevens against the Rutland and Burlington railroad company, to restrain them from proceeding to construct the extension of their road to Swanton.

### South Carolina.

*Kings Mountain Railroad.*—We learn that the Kings Mountain railroad, (says the Yorkville Miscellany,) is progressing as rapidly as can reasonably be hoped for. The grading contracts are all let with the exception of about a mile and a third. Many of the timber contracts are also made, and persons are almost daily applying for these sections not under contract. The iron has been contracted for also, and is expected to arrive in all during the spring. These facts will explain the rapid calls, that have been made on the stockholders. It is certainly the interest of the stockholders when once the expenditure of their money is commenced, to have the whole road completed as early as possible. Interest will in this manner be saved, and they will enjoy the benefits of their undertaking.

### Illinois.

*Aurora Branch Railroad.*—At a meeting of the stockholders of the Aurora branch railroad, on Friday, the 21st ult., the following gentlemen were elected directors for the ensuing year:

E. S. Wadsworth, President.

| | |
|---|---|
| S. F. Gale, | John Frink, |
| George Steel, | John Clifford, |
| J. Van Northick, | Benj. Hackney, |
| L. D. Bradey, | Allen Robbins. |

It is the intention of the board to proceed at once to an extension of the road from Aurora to a point on the proposed Galena branch of the Central road, some fifteen or twenty miles northwest of Peru. A glance at the map will show that when this is done, it will be one of the most important roads in connection with our city. The well known character of the board is a sufficient guaranty that whatever they may undertake will be prosecuted with the utmost energy.—*Chicago Tribune.*

### New York.

*The Straight Road to Batavia.*—The Batavia Spirit of the Times says the Buffalo and Rochester railroad company have accepted the proposals of H. U. Soper and S. C. Holden, for grading the whole line of the straight road from Batavia to where it strikes the present track eight miles from this city, a distance of 28 miles, building the bridges, doing the mason work, and preparing it for the timber and rails. The contract is not yet signed, as all the details are not yet perfected, but as that no doubt will soon be done, the work will probably be at once commenced, and completed with all possible despatch, so that by next spring we shall be able to go through in about forty minutes. This track, as surveyed, is nearly on the air line, thereby shortening the distance from the present route about eight miles between Batavia and Buffalo, and when completed will be the longest line of perfectly straight road in the State. It is laid out six rods wide, and we are informed that it will be ultimately graded for four tracks.—*Buffalo Com. Adv.*


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**ENGINEERS.**

**Atkinson, T. C.,**
Alexandria and Orange Railroad, Alexandria, Va.

**Clement, Wm. H.,**
Little Miami Railroad, Cincinnati, Ohio.

**Cozzens, W, H.,**
Engineer and Surveyor, St. Louis, Mo.

**Alfred W. Craven,**
Chief Engineer Croton Aqueduct, New York.

**Floyd-Jones, Charles,**
Alton and Sangamon Railroad, Alton, Illinois.

**Gay, Edward F.,**
Columbia and Philadelphia Railroad, Philadelphia Pa.

**Gzowski, Mr.,**
St. Lawrence & Atlantic Railroad, Montreal, Canada.

**Grant, James H.,**
Nashville and Chattanooga R. R., Nashville, Tenn.

**S. W. Hill,**
Mining Engineer and Surveyor, Eagle River, Lake Superior.

**Holcomb, F. P.**
Southwestern Railroad, Macon, Ga.

**Latrobe, B. H.,**
Baltimore and Ohio Railroad, Baltimore, Md.

**Miller, J. F.,**
Buffalo and Conhocton Valley Railroad, Bath, N. Y.

**Morris, Elwood,**
Schuylkill Navigation, Schuylkill Haven, Pa.

**Nott, Samuel,**
Lawrence and Manchester Railroad, Boston,

**Prichard, M. B.,**
East Tennessee and Georgia R. R., Cleveland, Tenn.

**W. Milnor Roberts,**
Bellefontaine and Indiana Railroad, Marion, Ohio.

**Roberts, Solomon W.,**
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

**Sanford, C. O.,**
South Side Railroad, Virginia.

**Steele, J. Dutton,**
Pottstown, Pa.

**Trautwine, John C.,**
Civil Engineer and Architect, Philadelphia.

**Tinkham, A. W.,**
United States Fort, Bucksport, Me.

**Troost, Lewis,**
Alabama and Tennessee Railroad, Selma, Ala.

**Whipple, S.,**
Civil Engineer and Bridge Builder, Utica, N. Y.

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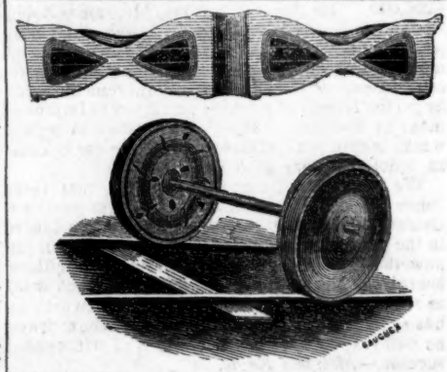

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Of all descriptions, *Warranted* Good.
**FILES.**
Manufacturers of Machinists' Warranted Best Cast Steel *Files*, expressly for working upon Iron and Steel, made very heavy for recutting.
☞ A full Stock of *Steel* and *Files* at all times on hand. 6m4

**Cumberland Steam Coal,**
FROM THE
FROSTBURG MINES, MD.
H. A. TUCKER,
Agent of Frostburg Coal Co.
*No. 50 Wall Street, New York.*

**Dudley B. Fuller & Co.,**
IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

**Manning & Lee,**
GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works. Maryland Mining Company's Cumberland Coal 'CED —'Potomac' and other good brands of Pig Iron.

**Samuel Kimber & Co.,**
**COMMISSION MERCHANTS**
WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.
July, 27, 1849.

**James Herron,** *Civil Engineer,*
OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,
PATENTEE OF THE
**HERRON RAILWAY TRACK.**
Models of this Track, on the most improved plans may be seen at the Engineer's office of the New York and Erie Railroad.

**PLUSHES**
FOR
**Railway Cars & Omnibuses.**
**F. S. & S. A. MARTINE,**
112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.
ALSO—CURLED HAIR, the best manufactured in market.

**To Railroad Companies, Machinists, Car Manufacturers, etc., etc.**
**CHARLES T. GILBERT,**
NO. 80 BROAD ST., NEW YORK,

IS prepared to contract for furnishing at manufacturer's prices—
Railroad iron,
Locomotive Engines,
Passenger and Freight Cars,
Car Wheels and Axles,
Chairs and Spikes.
Orders are invited; and all inquiries in relation to any of the above articles will receive immediate attention

**Manufacture of Patent Wire ROPE AND CABLES,**
For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tillers, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

**FORGING.**
**Ranstead, Dearborn & Co.,**
MANUFACTURERS OF
LOCOMOTIVE CRANKS AND CAR AXLES,
ALSO
WROUGHT IRON SHAFTING,
And All Kinds of Hammered Shapes.
Office 25 Foster's Wharf, Boston.

**Samuel D. Willmott,**
MERCHANT, AND MANUFACTURER OF
**CAST STEEL WARRANTED SAWS,**
—AND FILES—
IMPORTER OF THE
GENUINE WICKESRLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

**Railroad Instruments.**

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffers Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

**IRON.**

**Iron.**

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns' for sale by
COLEMAN, KELTON & CAMBELL,
109 N. Water St., Philadelphia.

**Stickney & Beatty,**
*DEALERS IN IRON AND IRON MANUFACTURERS.*

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel, Gunpowder and Locust Grove (Balt.) forge pig irons, Locust Grove and Laurel Irons for car wheels, Caledonian boiler blooms made from cold blast iron, Old Colony and anti-Eatam nails, Wm. Jessop & Son's steel, Coleman's blister steel and nail rods, sheet, hoop, band, oval and common English iron.

Nos. 18 and 20 South Charles st., Baltimore.

**Railroad Iron.**

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. J. F. WINSLOW, *President*
Troy, N.Y.
ERASTUS CORNING, Albany
WARREN DELANO, Jr., N.Y
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md
*November* 6, 1848.

**Railroad Iron.**

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phœnix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehannah river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.
Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.
REEVES, BUCK & CO.
45 North Water St. Philadelphia.
*March* 15, 1849

**LAP—WELDED**
**WROUGHT IRON TUBES**
FOR
**TUBULAR BOILERS,**
FROM ONE AND A QUARTER TO SEVEN INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.
THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

**Railroad Iron.**

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron. THOMAS B. SANDS & CO.,
73 New street,
*February* 3, 1849. New York.

**Iron Store.**

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.
MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.
August 16, 1849. 1y33

**Glendon Refined Iron.**

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "
Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for sale by GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.
Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head From the excellence of the material always used in their manufacture, and their very general use for rail roads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.
JOHN F. WINSLOW, *Agent.*
Albany Iron and Nail Works, Troy, N. Y.
The above Spikes may be had at factory prices, of Erastus Corning & Co Albany; Merritt, & Co., New York; E. Pratt & Brother, Baltimore, Md.

## Bowling Iron. Stamped B.O.

| | |
|---|---|
| Railway Tire Bars | Rivet Iron |
| Locomotive and other Axles | Locomotive Frame do |
| Boiler Plates | Bars. |

and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

## Ibbotson, Brothers & Co's CELEBRATED CAST STEEL AND

Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY I. IBBOTSON, Agent.,
218 Pearl st., New York.

## Railroad Iron. SPIKES.

Wrought Iron CHAIRS, New Pattern.

THE Undersigned continues to contract, as usual, for the above articles. The reputation already acquired for their excellent quality is a guarantee that strict attention shall continue to be paid to the wants and interests of purchasers.

CHARLES ILLIUS,
20 Beaver St., New York

## WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes," L Blister Steel.
Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—
Curtus & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
*May* 6, 1848.

## Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntzs Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by

RAYMOND & FULLERTON, 45 Cliff st.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

## Faggotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co.,
Boston, Mass.

These Axles enjoy the highest repulation for excellence, *and are all warranted.*

## Railroad Iron.

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "
10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by
DAVID W. WETMORE.
New York, March 26, 1850. 3m

## Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any port in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

## JOHNSON, CAMMELL & Co's Celebrated Cast Steel, AND ENGINEERING AND MACHINE FILES,

which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1849.

## Bowling Tire Bars.

40 Best Flange Bars 5½x2 inches, 11 feet long.
40 " 5½x2 " 7 feet 8 in. long.
40 " Flat " 6x2 " 11 feet long.
40 " 6x2 " 7 feet 8 in. long.

Now in store and for sale by
RAYMOND & FULLERTON,
45 Cliff street.

## Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.

Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
5m9 62 Buchanan's Wharf, Baltimore.

## S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.

Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Flue Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electerised Steel, etc., etc.

## Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.

Columbia refined Charcoal Blooms; Refined Charcoal Juniatta Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

## Tredegar Iron Works.

ROLLING MILL FOUNDRY AND MACHINE SHOPS. The undersigned continues to manufacture at his Works in this city (from best charcoal metal) Bar Iron of every description, embracing—Rounds and Squares, from ¼ to 5 inches diameter. Flats, from ¾ to 7 inches, all thicknesses. Bands and Scrolls, all sizes. Boiler plate and Plough Iron. Railroad and Locomotive Axles and Tires. Locomotive Frames, Spikes and Plates. Hoops, Ovals, Half Ovals, Half Rounds, Angle, T, L, and indeed every description of Iron usually manufactured, all of which he warrants to be equal to any made in this country. He also manufactures at his Foundry and Machine Shops all descriptions of Railroad Work, say, Locomotives, Railroad Wheels and Axles complete and ready for the road, Railroad Chairs, etc. Also, Marine and Stationary Engines all sizes, Sugar mills and Engines, Horse mills, and every kind of Machinery usually required for the operations of the country. He has paid particular attention to getting up machinery, etc., for Gold Mine operations, and those in want of such work might find it to their advantage to give him a call. J. R. ANDERSON.

Richmond, Va., Sept. 10, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

## Car Wheel Iron.

100 Tons "Columbia" No. 2 Cold Blast Charcoal Iron.
300 Tons "Salisbury" No. 1, do. do.
For sale by CHARLES T. GILBERT,
No. 80 Broad st.
New York, Sept. 21, 1850.

## Railroad Spikes.

THE subscribers are prepared to make and execute contracts for Railroad Spikes of a superior quality, manufactured by the New Jersey Iron Company, at Boonton. DUDLEY B. FULLER & CO.
139 Greenwich st. corner of Cedar.

## Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.
New York, Aug. 26, 1850.

N.B.—B., J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

## Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

## Spikes, Spikes, Spikes.

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplie by addressing J. W. FLACK,
March 6, 1850. Troy, N. Y.

## Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by
COLLINS, VOSE & CO.,
74 South St.
New York, June 1, 1850.

## Railroad Spikes, Boiler Rivets, etc.

THE Subscribers, Agents for the sale of James S. Spencer's, Jr., Railroad and Boat Spikes, Boiler Rivets, and Wrought Iron Chairs for Railroads, made at his Works near this city, will execute all orders with promptness, despatch, and of the best quality.

ALSO IMPORTERS of English refined and Merchant bar Iron; Extra refined Car and Locomotive Axles (from 3½ to 6½ inches in diameter); B. O. Locomotive Tire (welded by Baldwin). Also, supply Boiler and Flue Iron cut to pattern or otherwise.—Spring, Shear, and Cast Steel, etc., etc., etc.

T. & E. GEORGE.
Philadelphia, November 14, 1850.

## Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the *very best* quality for special purposes, is respectfully invited. COOPER & HEWITT,
17 Burling Slip, New York.
February 15, 1850.

## Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.
And at 5 Martin's Lane, City, London,
and 140 Buchanan st. Glasgow.
July 27th, 1850.

## Railway Iron.

THE Subscribers will contract to deliver, in the course of the ensuing Spring and Summer, the best English Rails, made by a particular specification, and of any pattern required.

DAVIS, BROOKS & CO.,
68 Broad st.

On hand for sale, English rails of 58 lbs. to the yard, made by particular specifications.

January 10, 1851. 2m

## To Iron Masters.

WANTED—A Person to take charge of a Blast Furnace for Smeling Iron, for further information apply to COLLINS, VOSE & CO.,
74 South street.

## Railroad Iron for Sale.

THE Mansfield and Sandusky City Railroad Co. have on hand from twelve to fifteen hundred tons of American Flat Bar Railroad Iron, weighing 38 lbs. to the lineal yard, which they offer for sale at reasonable rates.

The iron has been in use about four years, and is sound and in good condition. It is 2½ by ½.

It will be ready for delivery at short intervals between the opening of navigation in the spring and the 1st September next.

For further particulars inquire at the office of the company at Sandusky City, Ohio.

C. G. FORBES, President.

December 24, 1850.

## Railroad Iron.

THE "Montour Iron Company" is prepared to execute orders for Rails of the usual patterns and weights, and of any required length not exceeding 30 feet per rail. Apply at the office of the Company,
No. 73 South 4th st., Philadelphia,

Or to the Agents,
CHOUTEAU, MERLE & SANFORD,
NO. 51 New st., New York.

September, 1850.

## American Railroad Iron.

1000 Tons, weighing 50 lbs, per yard, manufactured by Reeves, Abbott & Co., at the Safe Harbor Iron Works, and now lying in yard at Brooklyn, for sale by
CHOUTEAU, MERLE & SANFORD,
No. 51 New street.

## Tubes.

The undersigned are in direct communication with the *Birmingham Patent Lap Welded Iron Tube Company*, for the sale of their very excellent and superior Boiler and Gas Tubes in large or small quantities.—These Tubes are sold very extensively in England and on the continent of Europe are sold exclusively by
WM. BIRD & CO.,
Iron and Tinplate Merchants,
44 Wall st., New York
5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

## Wanted.

WANTED—A Situation in a Civil Engineer's office, by a Young Gentleman from Scotland—has had six years' experience as a practical Draughtsman, Architect, Surveyor, and Leveller in one of the principal civil engineering establishments in Scotland. First rate reference given. Apply to Messrs. Cooper & Hewitt, 17 Burling Slip, or to
JAS. SNEDDON,
23 Harrison st.

## Wanted.

A Second-hand Locomotive of 10 to 15 tons weight. A note, giving lowest terms, addressed to A. B., Railroad Journal Office, will receive attention.

January 9, 1850.

## India-rubber for Railroad Cos.

RUBBER SPRINGS—*Bearing and Buffer—Fuller's Patent—Hose* from 1 to 1 9' ..rdiameter Suction Hose. *Steam Packing* ..om 1-16 to 2 in thick. *Rubber and Gutta Percha Bands.* These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849. No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of rail roads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street
New York, May 21, 1849.

## Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part IV of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," including the Equibrium of Arches, the mathematical principles of the Oblique Arch, Suspension Arch, etc., Construction of Foundations in Water, Centering, Oblique Arches, etc., the application of Iron to Railroad Structures, Practical Tunnelling, Suspension Bridges, etc.; illustrated by numerous accurately executed Plans. Elevations, Sections and Details of Stone, Iron and Wood Bridges, Viaducts, Tunnels, Culverts, Machines, etc., constructed by the most eminent Architects and Engineers in Europe and the United States, and numerous Original Designs for Bridges, Viaducts, Culverts, etc. The whole calculated to meet the exigencies of Engineers, and assist Draughtsmen, Bridge Builders, Mechanics and Students. By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and details of the Iron Lattice Bridge 140 feet span over the canal in the suburbs of Dublin on the line of the Dublin and Drogheda R.R., Plans, elevations and sections of the Timber Bridge over the Schuylkill, at Market st., Philadelphia, with Arches 160 and 190 feet span. Plans, elevations and sections of a Timber Bridge with Arches 155 and 200 feet span over the Delaware. Also, plans, elevations, sections and details of Lattice and Frame Wood Bridges, explanatory of Nathaniel Towns and Colonel S. H. Long's methods of constructing Bridges of Wood, with the continuation of the Articles on Coffer dams, Concrete, Limes, Mortars, Cements, etc.

Published by George Duggan, 300 Broadway, New York, to whom all communcations should be addressed and subscriptions forwarded.

☞ Parties remitting Mr. Duggan $5. and the remainder $4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc.." shall receive it monthly as published. To those making Mr. Duggan a present remittance of $9, the work will be forwarded post free to any part of the United States.

## Great American Engineering

AND MECHANICAL WORK, just published in medium folio One Dollar, 75 cts. to Subscribers.

Part X. of "Specimens of the Stone, Iron & Wood Bridges Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, and sections of the Timber Bridge with Arches 136 feet span, over the Mohawk river, on the line of the Utica and Schenectady R.R. Plans elevations, sections and isometrical views of Timber Piers 100 feet high, a Timber Bridge of 55 feet span, and Ice Breakers, on the line of the Little Schuylkill and Susquehanna R.R.

Also plans, elevations, sections, isometrical views and details of an Iron Bridge 356 feet long, with Arches 81 feet span, erected by the N. York Iron Bridge Co. over Moores Creek, on the line of the Virginia Central R.R., and plans, elevations and sections of an Iron Plank Road Bridge 160 feet span, erected over Buffalo creek by the same company, with a description of Col. Long's method of constructing Bridges in Iron, and an explanation of the causes that led to the failure of the Iron Bridge 60 feet span, near Lackawaxen, on the line of the New York and Erie R. R., at midday, on the 31st July last, by which several lives were lost, and a great amount of property destroyed.

Published by GEORGE DUGGAN,
300 Broadway, New York.

To whom all communications should be addressed and subscriptions forwarded.

## Railroad Lanterns.

COPPER and Iron Lanterns for Railroad Engines, fitted with heavy silver plated Parabolic Reflectors of the most approved construction, and Solar Argand Lamps; manufactured by
HENRY N. HOOPER & CO.,
No. 24 Commercial St. Boston.

August, 16, 1849. 6m33

## For Sale.

TWO Locomotive Engines—10½ tons weight, built by Baldwin. Also Four Eight-wheeled Passenger Cars, with side seats, all in good running order. Apply to WM. E. MORRIS,
Office of Philad., Germantown & Norristown Railroad Co., 9th and Green sts., Philadelphia. 3m5

## TO RAILROAD COMPANIES, CAR MANUFACTURERS, etc.

THE Undersigned hereby gives public notice, that the Commissioner of Patents, pursuant to his decision in relation thereto, on the 8th day of October, 1850, issued to him a Patent for the sole right to manufacture, and exclusive use of the INDIA RUBBER CAR SPRING, on account of priority of invention of said Spring. F. M. RAY.

New York, Oct. 23, 1850.

## Iron Trade of Pennsylvania.

DOCUMENTS and Statistics relating to the Manufacture of Iron in the State of Pennsylvania—giving a history of the manufacture from its commencement to this date, illustrated by diagrams. Also tables giving the address and capacity of every establishment in the State. Prepared by direction of the late convention of the trade held in Philadelphia. For sale by
LINDSAY & BLACKISTON, Philadelphia.
FIELDING LUCUS, Jr., Baltimore.
HENRY G. NICHOLS, 79 Water st., N. Y.
or at this office—price $1 00.

It will be sent by mail to any order enclosing the money, and post paid.

## Ulster Iron.

THE ULSTER IRON WORKS, Saugerties, N. Y., continue in full operation. Orders for *round, square, flat, band, hoop and scroll iron*, will be received and promptly executed by
J. & L. TUCKERMAN,
69 West St., New York.

## Patent Machine Picket Fence

SIX DIFFERENT STYLES of this fence are now made by patent machinery; and is by far the most economical fence for *Railroads, Farms, Yards*, etc., ever yet offered to the public, costing only from 4 to 30 cents per foot, according to pattern; and is so put up as to be shipped at a trifling expense. Full particulars will be furnished, by addressing the subscriber, to whom all orders should be sent.

N. STRATTON, Troy, N.Y.

## Providence Tool Co.,

MANUFACTURERS OF
Plane Irons, Tooth Irons, Soft Moulding and Rabbet Irons, Cornice Irons, Plow Bitts, and Planing Machine Knives:
NUTS, WASHERS AND BOLTS.
—ALSO—
PLATE HINGES AND PICK AXES.

They are prepared to execute orders for all descriptions of Cold Punching and Job Work.

WM. FIELD, Agent. RUFUS WATERMAN, Treas.
*PROVIDENCE, R. I.*

## Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS J. LOVEGROVE,
Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

## Railroad Letting, in Virginia.

PROPOSALS will be received at the office of the chief engineer of the Richmond and Danville railroad, until 9 o'clock A. M., Monday, the 10th of March, to be decided the 13th of the same month, for doing all the grubbing, clearing, grading, ditching and masonry, on the Richmond and Danville railroad, in the counties of Amelia, Nottoway, Prince Edward, Lunenburg and Charlotte, comprehending about 45 miles of road.

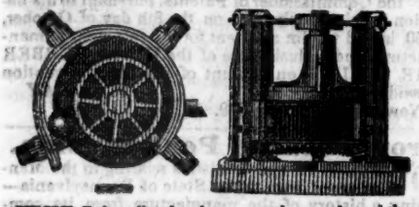
Profiles and specifications can now be seen at the office of the company in Richmond; and after the 10th of February, at the offices of the resident engineers, on the line, at Burkeville and Keysville.

By order of the board of directors,
ANDREW TALCOTT,
Chief Engineer R. & D. railroad.

Engineering department R. & D. R. R. Co., Richmond, Jan. 22, 1851.

## MACHINERY.

### Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phœnixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has give universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

### Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery *for making Spikes*, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, *Agent*,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNdersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

### Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

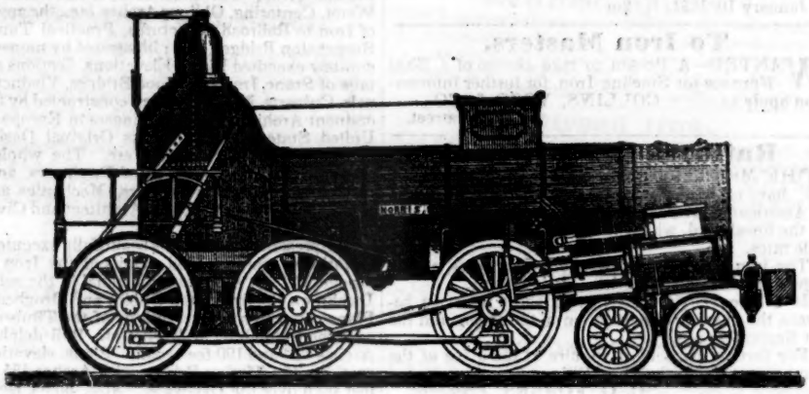
He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others. J. L. BROWN.

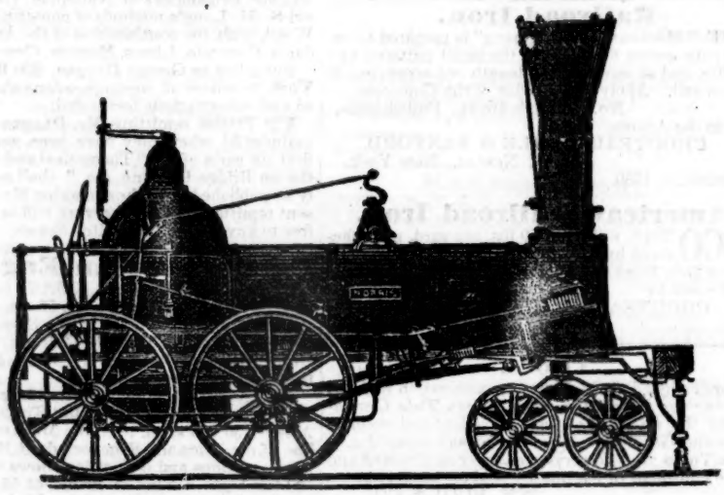
☞ Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

## NORRIS' LOCOMOTIVE WORKS.

### BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,





THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tires are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

### PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest. P. A. BURDEN, *Agent*,
Troy Iron and Nail Factory, Troy, N. Y.

### Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,
☞ *Sole Manufacturers,* ☜
No. 85 Liberty St.
NEW YORK.

And in the principal cities and towns in the U. States.

☞ The Premium of the AMERICAN INSTITUTE was awarded to the *Etna Safety Fuse* at the late Fair held in this city.

November 3, 1849. 1y

COLUMBUS, OHIO,

### Railroad Car Manufactory.

### RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited. 1y8

### FOR SALE.

THREE LOCOMOTIVES, Manufactured by M. W. Baldwin, of 10 tons weight, all in complete repair, and now running on the Columbia and Philadelphia Railroad.

For particulars apply to A. L. Roumfort, Supt. of said road, either at Philadelphia, or Parkersburg, Chester county. A. L. ROUMFORT,
Supt. Motive Power Col. & Philad. R.R.